December 1977

Smithsonian

A suppressed 'Alice' episode that Tenniel refused to illustrate, 'The Wasp in a Wig' (p. 50)

—by Ralph Steadman after Tenniel

"I would like to present to you the 1978 Cordoba, and to tell you about this extraordinary new automobile in greater detail than is possible in a television commercial."

Ricardo Montalbán

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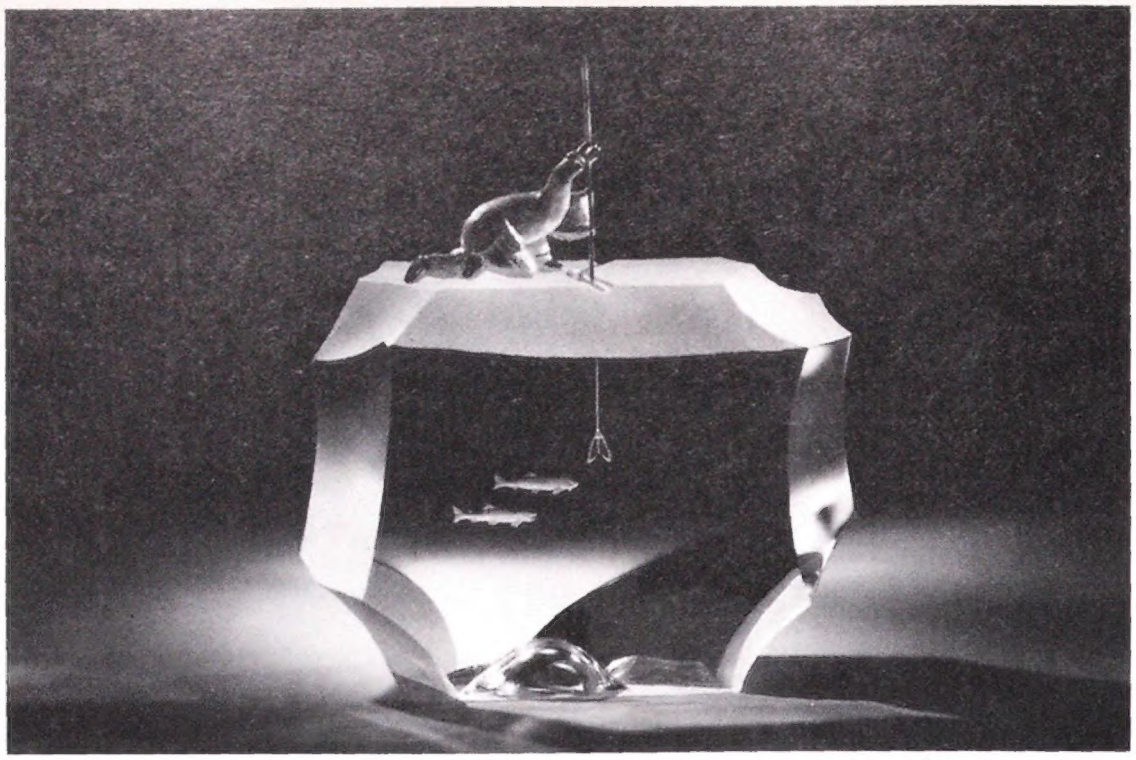

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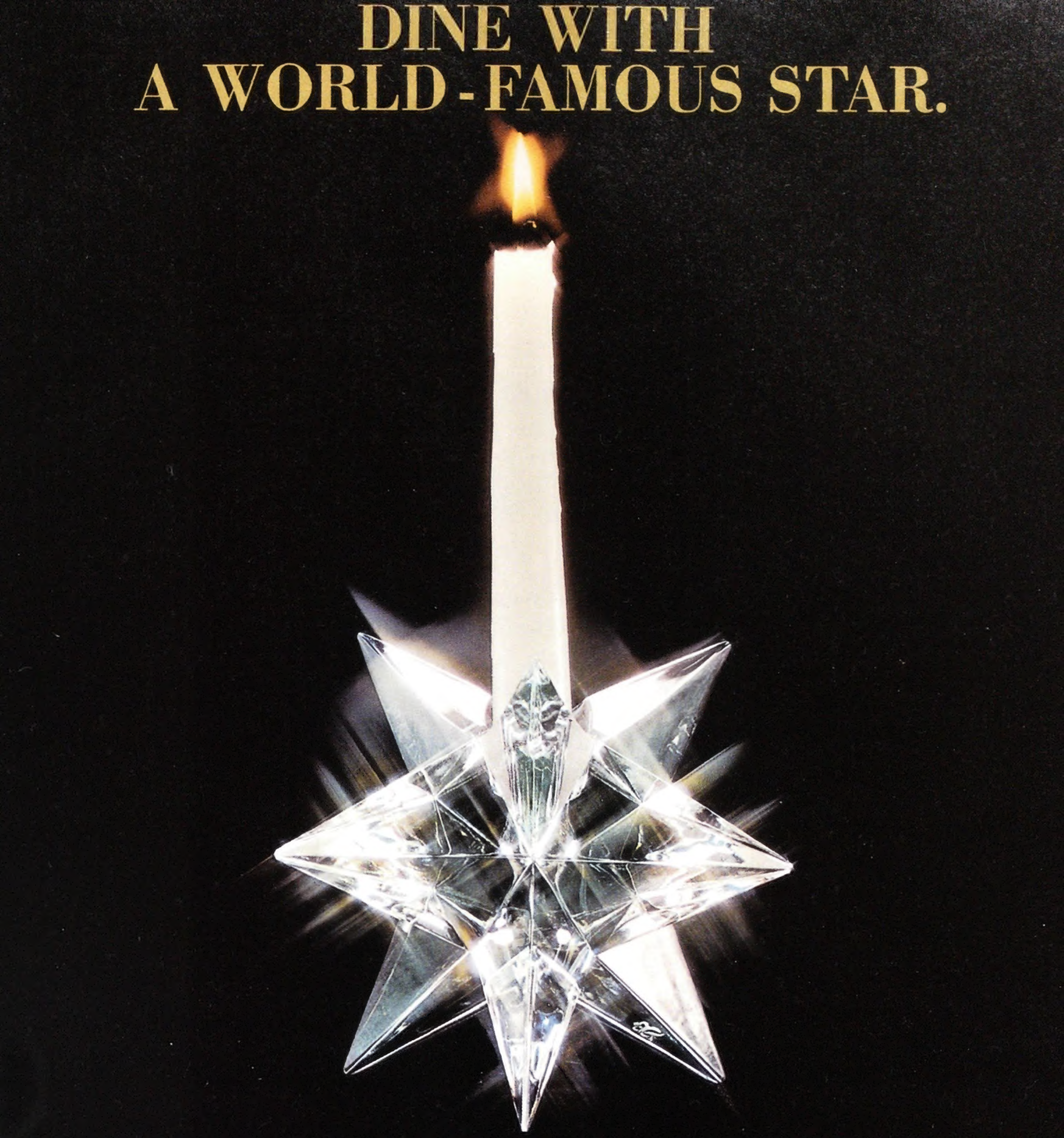

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This Polaroid SX-70 photograph by Ansel Adams was exhibited at a major New York gallery.

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The view from the castle

The Galápagos Islands are revisited:
as astonishing as in Darwin's time, they
enjoy protection along with progress

I have not as yet noticed by far the most remarkable feature in the natural history of this archipelago; it is, that the different islands to a considerable extent are inhabited by a different set of beings. [There are] tortoise, mocking-thrush, finches and numerous plants. . . . One is astonished by the amount of creative force . . . displayed on these small, barren, and rocky islands.
(*from* The Voyage of the Beagle)

So wrote Charles Darwin about his visit to the Galápagos Islands off the west coast of South America in September 1832. Years later the thoughts based on these observations—along with many others—were to be crystallized into his great theory of evolution.

My own first visit was in 1937, in a schooner on the way out to a year of studying birds in New Guinea. Now, 40 years later, I have recently returned with my wife to Galápagos in an effort to help underscore the importance of these islands to world conservation.

In 1937 the government of Ecuador had limited interest in its isolated possessions; now our trip was made notable by the presence of the Foreign Minister of Ecuador, Dr. José Ayala Lasso, accompanied by two associates, and by Teodoro Suarez N., an engineer with the Department of Agriculture. The Galápagos Islands now form an Ecuadorian province, with an airport, administrative offices, defense installations and a small tourist industry. Alongside this growing governmental involvement has been the development of the Charles Darwin Foundation for the Galápagos Isles, established in Brussels in 1959 as a consortium of societies and government-supported institutions—with UNESCO backing—in Belgium, West Germany, France, Great Britain and the United States.

Eighteen years after the founding of the Charles Darwin Foundation, and 145 years after the voyage of the *Beagle* on which Darwin journeyed, what did we find? We clambered up and down over lava seeking out fur seals and sea lions, birds of some 43 species, land and marine iguanas, lizards, tortoises, turtles.

The effect was overwhelming. In spite of the ravages of time and civilization, the Ecuadorian national parks system, collaborating with the Darwin Foundation, has persevered in protecting the environment and in training its park "wardens," or rangers, and guides for the tourists. Dedication is at a high level, for Galápaguinos are proud of their natural habitat. On the little island of South Plaza, my favorite of our brief visit, swallow-tail gulls beat along the windy, black lava cliffs, alternating with rows of stiff-winged, red-tailed tropic birds, noddy terns, boobies and flying Audubon's shearwaters. Inland, other gulls perched, necks vibrating, outstretched heads and bills emitting their greeting, an ungull-like rattling sound.

I had remarked on this soft, warbling rattle in my diary for February 1937, and the fact that these gulls circled curiously over our schooner at night. Only years later, when Jack P. Hailman, the animal behavior specialist, studied these seabirds did we learn that the lustrous-eyed creatures catch fish and squid at night, the only nocturnal-feeding gulls in the world!

What hope for Man's future, to live in harmony with such a laboratory of nature's creation. The world is better for this unity of purpose in an essential cause.

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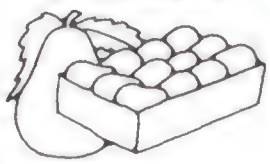
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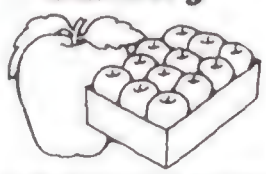
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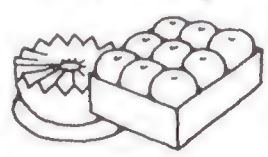
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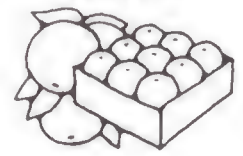
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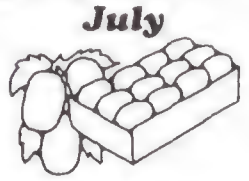
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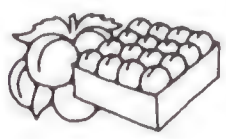
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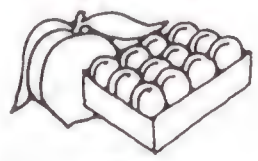
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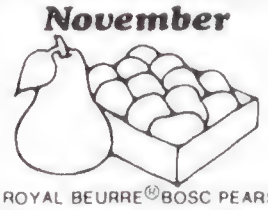
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Phenomena, comment and notes

Earthquake perception, the inside story of the lynx and the hare, and net energies of steak and lobster

In past issues of this magazine, the question of net energy has been raised, particularly in regard to agriculture. Does it take more energy (in the form of fertilizer, mechanization, transport and so forth) to grow some particular food item than the food itself provides? We all know by now that our love of beef is an energy-intensive addiction, and some of us may even feel a touch guilty as we wipe the grease off our chops after devouring the last of the charcoal-broiled steak. But most of us go on responding only to price, not moral suasion.

For the curious, however, it is interesting to note that, according to *Science* (Vol. 198, No. 4314), producing the beef we eat (129 pounds per person in 1976) requires the equivalent of up to 50 gallons of gasoline.

One could shrug. Or one could become a vegetarian, but most of us prefer not to because, among other things, animal-protein food is balanced in its essential amino acids and, unlike plants, provides vitamin B12. How about seafood? Isn't that less energy-intensive? The same issue of *Science* analyzes the energy costs for various kinds of seafood and the results are in some cases surprising.

Lobster is just slightly less energy-intensive than feedlot beef. Shrimp is far more so than, say, milk. King salmon is slightly more than broiler chicken. Many other seafoods are less energy-intensive than farm animals.

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A lot of the energy costs are involved in processing, *i.e.*, how much of the fish is used, whether it is canned and so on. But how it is cooked is also critical, adding on the average one-third of the energy costs. Tuna fish, for example (and please don't use eastern Pacific yellowfin or you may have wasted a porpoise), can be eaten uncooked at no additional energy cost, or you can cook it in the oven and waste up to 8,500 kilocalories an hour.

A complication of cycles

People who amuse themselves by seeking out cycles in all manner of phenomena (SMITHSONIAN, March 1977) like to point, as an example, to the snowshoe hare-lynx population cycle in Canada. There, it was discovered years ago by analyzing records of hare and lynx pelts bought from trappers by the Hudson's Bay Company during 220 years, the lynx population seemed to rise and fall every eight years, following rises and falls of the hare. A classic predator-prey cycle.

Recently, however, this instance of cyclical theory has come in for a few

A snowshoe hare: food on the table.

Lynx: less value to a hungry trapper.

lumps. One researcher pointed out that island-bound hare populations oscillate in the absence of lynx. Another pointed out that the lynx increases follow too quickly the hare increases—leaving not enough time for the lynx to have more young to swell the population. Then another scholar, of an even more mathematical bent, subjected the records to a more strenuous statistical analysis and came up with graphs showing, mirabile dictu, that the hare prey on the lynx, or more realistically, that increases in hare indirectly kill lynx.

The answer to this embarrassing paradox is to be found in considering the sources of the records: the Hudson's Bay Company, which bought from trappers. And trappers, reports Martin S. Weinstein of British Columbia in *The Ameri-*

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Joplin — Newton's Jewelry
Manchester — Tyme Shop
Reeds Spring — Wilderness Road Clocks
St. Louis — Wick Furniture
Springfield — Phelps Paint and Paper Store
NEBRASKA
Lincoln — Kaufman's Furniture
Omaha — Nebraska Furniture Mart
NEVADA
Reno — John Breuner's
NEW JERSEY
Avon — World of Clocks
Bridgewater — Huffman-Koos
Camden — J.B. Van Sciver's
East Brunswick — Huffman-Koos
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Paramus — Old Timers
Parsippany — Huffman-Koos
Passaic — Cane's Furniture
Paterson — James-Pritz Co., Inc.
Point Pleasant Beach — Johnson's Furniture Mart
Pompton Plains — Huffman-Koos
Rahway — Huffman-Koos
Springfield — Huffman-Koos
Totowa — Huffman-Koos
Trenton — J.B. Van Sciver's
NEW MEXICO
Albuquerque — American Furniture
NEW YORK
Brooklyn — Crest-View Sales
Buffalo — Cape Cod Shoppe
Deer Park — Georgetown Manor
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New York — Kenmore Furniture
Rochester — Charlotte Appliance
Staten Island — Huss Furniture
NORTH CAROLINA
Greensboro — The Pendulum
High Point — Boyles Furniture
Mooresville — Steven's Furniture
Statesville — Blackwelder's Furniture
OHIO
Aurora — Aurora Farms Furniture
Cincinnati — Swallen's
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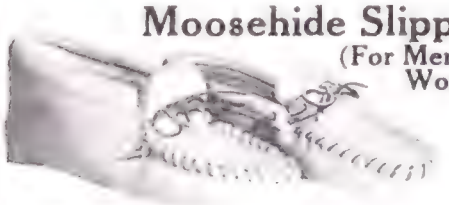

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can Naturalist (Vol. 111, No. 980), are also predators—of hare, lynx and other fur-bearing mammals. Lynx are more valuable as pelts, though less valuable as food than hare, and are far harder to trap. In years of high hare numbers, trappers' food needs would be more easily fulfilled, leaving them time to go after a few lynx, which probably concentrate themselves along hare runs. In low hare years, trappers would have to spend all their time in pursuit of hare or other efficiently harvested fur animals, such as beavers, to satisfy their subsistence needs, thus taking fewer lynx pelts.

Violence and genes

There was a lot of scientific excitement a few years back over the idea that men who had an extra Y chromosome in their genetic makeup were likely to perpetrate violent, often horrifying crimes. There seemed to be a disproportionate number of such men, usually tall, in prisons.

Now a group of researchers report on a relatively exhaustive study of the subject in *The Sciences* (Vol. 17, No. 6) in which 4,139 men in Denmark were thoroughly scrutinized. Of these, 12 were XYYs, and of those, 5 had criminal records. That's more than 40 percent, whereas only 9.3 percent of the normal (XY) men had records. This would seem to confirm that XYY men are more aggressive and violent—except that the level of *violent* crimes among the XYYs was no different from that among XYs.

On the other hand, genetic aberrations generally tend to slow development, the researchers say (so watch it, you genetic engineers out there). The XYY men are generally tall and also below average intellectually; and the Danish XYYs were no exception. Comparing them with XY men of the same intelligence level, the researchers found that tall XYYs had a crime rate that is higher than genetically normal men. However, the study did not provide much evidence that this elevated crime rate is due to a higher level of aggression in XYY men. Just what the extra chromosome does to these men remains to be discovered.

Scholarly gatherings

Members of the various branches of science are wont to gather clannishly in hotels at annual intervals to hold assem-

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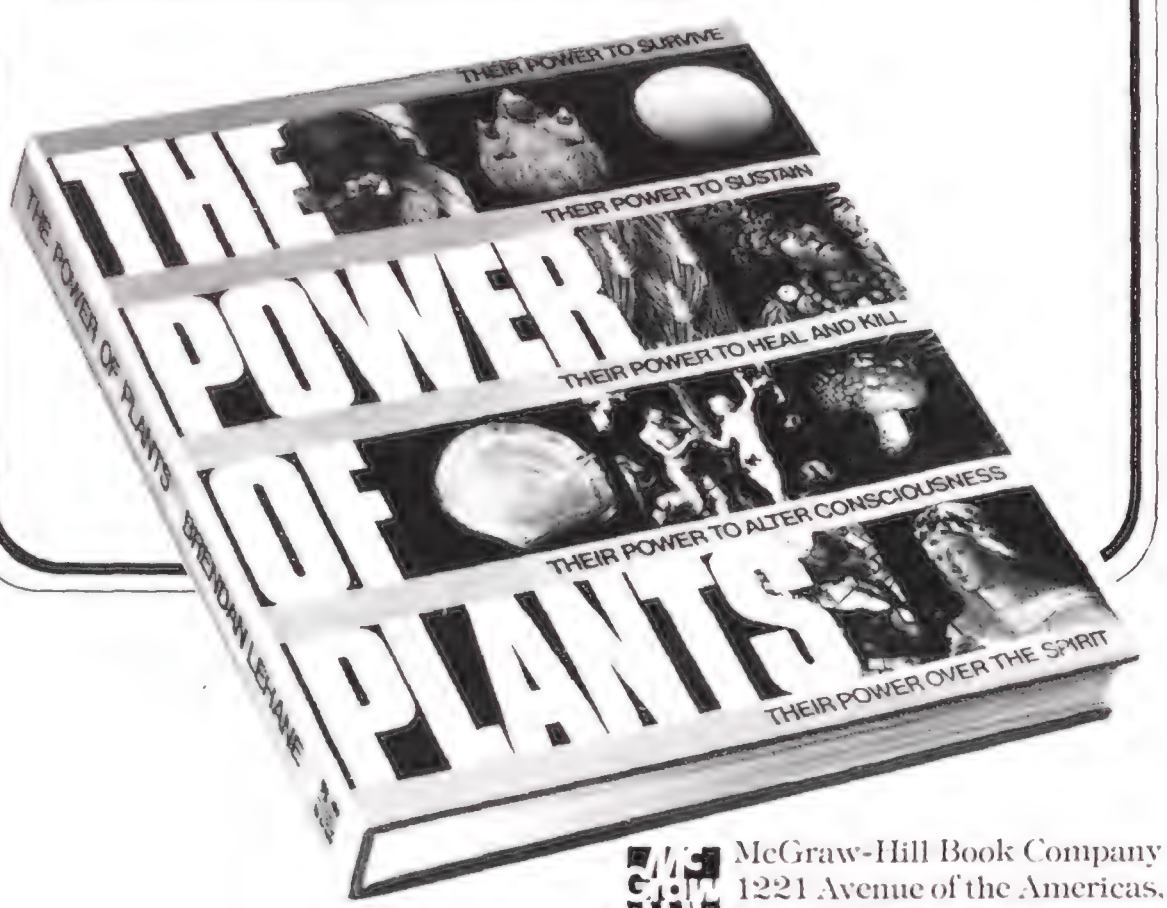
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blies called conventions, during which they advance the state of the art by reading papers to a few of their colleagues while the majority of the brethren dicker in the hallways and bars hustling jobs. Some scientific conventions are more desirable than others, *New Scientist* (Vol. 76, No. 1072) reports.

According to a Chicago hotelier, mathematicians are a sober lot and provide the hotel with few profits at the bar. Psychologists spend ample—huge, even—amounts at the bar, but are inclined to violence, and thus "the bar profits vanish in repair bills." (Perhaps the psychologists' chromosomes need investigating.) Anthropologists, however, though fewer in number, are good conventioneers: they drink heavily but do not take out their aggressions on the hotel.

Just how heartily the anthropological community quaffs its way through the annual head-hunting ceremony is brought to mind by memories of one such meeting that took place in Denver some years ago. An earthquake occurred one night during the anthropological carryings-on. The newspaper the next morning reported that the quake was sufficiently severe to make the anthropologists' very hotel sway violently. Discussion the next day with a reasonably large sample of anthropologists turned up no one who had felt a thing. Nor, of course, had this reporter.

—James K. Page jr.

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Letters to the Editor

Teen-age prodigies

Dear Sir: In regard to David Nevin's article on young prodigies in the October issue, Professor Julian Stanley deserves much praise and credit for the successful Study of Mathematically Precocious Youth (SMPY) program at Johns Hopkins University. Often overlooked, however, is the fact that early admission programs, similar to the SMPY program, have been routinely available at a number of universities and colleges for 25 years or more, with similar results being achieved. An aspect of the SMPY program not shared by some other early admission programs is the emphasis on mathematical skills.

Roulette William Smith
Instructional Science
Far West Laboratory
San Francisco

Dear Sir: As a retired philosophy professor with nearly 40 years of teaching college students, I am firmly convinced that biologically males are superior in *reasoning* to females. I can recall fewer than a dozen girls who showed real ability or interest in logic and related fields, but there were scores of boys who were extraordinarily gifted in this area.

Alonso Cady
Rancho Palos Verdes, California

Dear Sir: As parents of two gifted daughters and an above-average son, we are sure that other parents of gifted children have experienced some of the same frustrations that we have had. Unfortunately, owing to the attitude of the public school system, too many of these children are "turned off." Many of us are not in a position to afford private schools and, since our children tend to be "unconventional," they don't always find an understanding teacher who keeps them on the path to learning.

Mr. & Mrs. Robert K. Griffin
Reno

Dear Sir: As one of the "early graduates" featured in David Nevin's article, I believe I must clarify a point made in the article that might mislead readers.

Whenever I speak to someone about my experiences with educational advancement, almost always the first questions I am asked are about my social and emotional development: "Didn't you feel out of place being several years younger than the rest of the students in college?"; "Do you associate mostly with other early entrants?"; "What about girls and dating?" Until otherwise informed, it is surprising how many people feel sure that along with educational acceleration must necessarily come some sort of social and emotional maladjustment.

The article states that the early entrants to Hopkins didn't begin dating until about 16, and then chose girls of their own age. I am specifically quoted as saying, "It's too early for seriousness with girls to be a valid question." For the past two years at Hopkins, I have been seeing a girl who is two years older than I am, and I believe our relationship to be as "serious" as it is necessary for persons of her or my age to be. When I spoke to Mr. Nevin, I understood his question about "serious" relationships to refer to those of a marital nature. My statement did not imply that "early entrants to college are not interested in seeing a girl on a regular basis," as I'm afraid it could be misconstrued, but that it is really too early for me to decide questions about something as serious as marriage.

Eugene W. Stark
Cambridge, Massachusetts

The Book of Kells

Dear Sir: In the "Great *Book of Kells*" article, author Alfred Friendly asks how "such a joyful, wildly colorful, explosively imaginative volume" could have emerged "from the gloom of the Dark Ages?" The answer is: these monks were Roman Catholic; their religion was not for them a morbid curiosity; their God

is a God Who seems to have a sense of humor, and a good one at that. And the reason behind their working so diligently to produce such a masterpiece was undoubtedly their love for God, their devotion to religion and their ability to laugh. It's a pity that Cromwell couldn't appreciate any of these qualities.
The Reverend Ronald A. Antinarelli
Auburn, New York

Dear Sir: An explanation solving the mystery of the exuberant monks comes readily to mind—they were Irish. As G. K. Chesterton wrote in the *Ballad of the White Horse:*

For the great Gaels of Ireland
Are the men that God made mad,
For all their wars are merry,
And all their songs are sad.

It seems that the balance in this bundle of contradictions runs in favor of the blithe of spirit.
Mrs. Fred Kendrick
Toledo, Ohio

"Splendors of Nature"

Dear Sir: I believe you should have identified the *Attacus atlas* as moths rather than butterflies.
Paul Goldstein, junior entomologist
Bryn Mawr, Pennsylvania
Paul Goldstein is correct. Ed.

Phenomena, comment and notes

Dear Sir: Concerning the item "Europe's first Mesolithic ladder," it was quickly obvious to me, as I am sure it would be to any other beekeeper, that the two men near the bottom of the ladder in the drawing are departing so quickly because even in those times honeybees possessed the one weapon responsible for the survival of the species through the ages—stingers loaded with venom.
Tom E. Clarke
Seattle

Dear Sir: The picture of "Honey gathering in prehistoric Spain" is a drawing made at the scene of the rock art by a local artist. I visited the site at the same time as the Belgians mentioned. They were *not* the discoverers. We were all led there by the artist.
Harold E. Blum, Professor Emeritus
State University of New York (Albany)
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Folklife Festival

Dear Sir: I am a hammered-dulcimer player and maker and, though I have asked many people about the origin of the instrument, I have received a multitude of answers, few of which coincide with each other. Your article asserts a tenth-century origin in Persia. This apparently discounts Biblical mention of the dulcimer and psalter, as well as early Babylonian stone carvings.

David R. Peterson
Greenbrier, Arkansas

According to Nancy Groce of Smithsonian's Division of Musical Instruments, the Babylonian frieze is a reconstruction built by art historians at the turn of the century. It is located in the British Museum, but the accuracy of this reproduction has been discounted because the original frieze had harplike instruments rather than dulcimers. In the King James version of the Bible, "dulcimer" was a mistranslation of the Greek word "symphonia," a form of bagpipe. Ed.

Mnemonics

Dear Sir: With reference to the article by Michael Olmert, "It's hard enough to say it, let alone to remember it," I suggest a more memorable mnenomic, taken from *The Britons: A rhymed history of England.* (And it restores King John, whom you omitted, to his rightful place.)

First *William,* the Norman; then *William,* his son;/*Henry, Stephen,* and *Henry,* then *Richard* and *John;*/Next *Henry* the third, *Edwards,* one two and three;/And again, after *Richard,* three *Henries* we see;/Two *Edwards,* third *Richard;* if rightly I guess;/Two *Henries;*/sixth *Edward;* Queen Mary; Queen *Bess;*/Then *Jamie,* the Scotchman; then *Charles,* whom they slew,/Yet received after *Cromwell,* another *Charles* too./Next *James,* the second ascended the throne;/Then *William* and *Mary* together came on;/Till *Anne, Georges* four and fourth *William,* all past,/God sent Queen Victoria, may she long be the last!

Dulcimer, as shown in copy of a late 17th-century German engraving by Johann Weigel, is from his book *Musicalisches Theatrum.*

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My own addenda bring them up to date:

> But 60 years later she, too, went to heaven,/And next on the throne was her son, Edward Seven;/George the Fifth, Edward Eighth (abdication not reckoned);/And, at last, George the Sixth and Elizabeth Second.

John L. Chamberlain jr.
Washington, D.C.

Dear Sir: In the mnemonic device given for the geological periods, I believe the last six are the epochs of the Cenozoic era—not the periods. When I began teaching freshman-sophomore zoology, my husband devised a mnemonic for me: "Caution! Orderly sophomores don't miss periods, please. The just consequences threaten quality-points." (Cambrian, Ordovician, Silurian, Devonian, Mississippian, Pennsylvanian, Permian, Triassic, Jurassic, Cretaceous, Tertiary, Quaternary—the latter two periods of the Cenozoic era.)
Dorothy S. Daugherty
Marshall University
Huntington, West Virginia

Dear Sir: One time-honored memory aid, known to medical and nursing students, is this one for the 12 cranial nerves: "On old Olympus' tufted tops, a Finn and German viewed some hops." (Olfactory, Optic, Oculomotor, Trochlear, Trigeminal, Abducent, Facial, Acoustic, Glossopharyngeal, Vagus, Spinal accessory, Hypoglossal.)

There are a number of variations on this mnemonic, but this is the one that we learned in school.
Mildred Riebel, Dr. Robert Mehnert
Oceanside, California

Nuclear injuries

Dear Sir: In your October "Letters to the Editor," the portion of my letter regarding the safety record of nuclear energy did not include one crucial point I made originally: in the 32-year history of nuclear energy utilization, not a single member of the public was killed or injured due to a radiation-related accident at a commercial-power reactor or its auxiliary facilities. Most were very conventional mishaps—falls, auto and airplane accidents, burns.
Paul Turner, Vice President
Atomic Industrial Forum, Inc.
Washington, D.C.

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Around the Mall and beyond

Two baubles have been added to the gem collection at the Museum of Natural History to keep the Hope Diamond from getting self-conscious. First a 67.89-carat diamond, the Victoria-Transvaal, was given to the Smithsonian, then a 75-carat emerald brooch. Both appear on page 30, the diamond in a display case in Gem Hall, traditionally one of our most popular museum areas. The Hope Diamond, incidentally, is 45.52 carats, practically puny by comparison, but its blue color and its historical associations make it still the champ when it comes to value.

The emerald was presented to the Smithsonian on an October afternoon by Mrs. Stewart Hooker, sister of Walter Annenberg, our former Ambassador to Great Britain. She is an old friend of the Institution (I guess that goes without saying), and her incredible generosity was honored at a small reception in Secretary Ripley's office in the castle. It was attended by a number of dignified Smithsonian officials in dark pinstriped suits and well-shined black shoes; by Mrs. Hooker, who was wearing some splendid pieces of jade; by some of her friends, elegantly attired; and by me in a green blazer with dog-eared pocket flaps and a loose button.

There was some decorous conversation and a little sipping, and then Mrs. Hooker said she guessed maybe we'd like to see the emerald, and Mr. Ripley said, why, *that's* a thought, and Mrs. Hooker produced a small black box and opened it to display a huge green square with a wreath of diamonds around it. We passed it around. I wasn't wearing a dark, pinstriped suit so I didn't feel I should hold it in my hand, but I did touch it just enough to get my fingerprints on it. It had a rich, soapy feeling.

The emerald was supposed to have fitted into the belt buckle of Abdul-Hamid II, one of the last sultans of Turkey. Abdul-Hamid came to the throne of the Ottoman Empire in 1876, touted as a liberal who would give the nod to some constitutional government, but he turned out to be a quarrelsome absolutist who greatly admired Kaiser Wilhelm II of Germany, hated the intellectuals in his own realm, and was beset by uprisings which he quelled with more than normal enthusiasm until the turmoil stirred up by the Young Turks forced him off his throne in 1909. It was next to his bloodthirsty belly (ulcerated? probably not) that this magnificent gem resided.

Or did it? Paul Desautels, Curator of Gems and Minerals at the Museum of Natural History and the new guardian of the emerald, says that he thinks the stone was mined in Colombia. He says he

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doesn't have much solid basis for thinking that—just a feeling, after looking at it carefully. It has certain inclusions—vestiges of foreign material—which seem to match those of other Colombian emeralds. A good gem man can tell a lot about the source of a mineral sample by looking at the inclusions. They're a little like my fingerprints.

If the stone came from Colombia, could it have found its way to the sultan's belt buckle? Perhaps. But does it really matter? Desautels says that most big stones have a romantic story behind them—often fabricated—to add zest and provide publicity, which is sometimes needed in order to get the price up.

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Mr. and Mrs. Leonard Wilkinson, who are also friends (you can say *that* again!) of the Institution.

This slightly amber chunk of sparkle was mined in South Africa in 1950. In order to give it some publicity, one of its owners got it into the movies. It appeared in *Tarzan's Savage Fury*, starring Lex Barker and Dorothy Hart, a film about, well, Tarzan and Jane and this big diamond and stuff like that. I finally found someone who had seen it, Mike Laskin from the gem collection, and he says he can't remember much about it that was different from any other Tarzan film except that this one was especially boring.

"Diamond?" repeated Mike. "Yeah, that's right. It was used as the eye of some statue of a god, as I remember. Not a big deal, you know. Just this eye that everyone hassled about. *Boring*. You can still catch it on TV reruns. Don't bother."

I asked Desautels if it didn't seem strange that a real diamond should be used in a movie. He said it was unusual, but that the uptightness that people feel about a great stone is not really rational. People can handle the concept—even the bundled currency—of a million dollars without breaking out with a fever, but a glittering diamond or gleaming emerald makes them tremble and sweat until they get used to the idea. I asked Mrs. Hooker how she had brought the emerald to the Smithsonian and she answered, "Why, in my purse, of course."

Just a little black purse. A nice one, mind you, but just a purse. And similarly Lex Barker and Dorothy Hart, not to mention the movie prop people, probably tossed the Victoria-Transvaal diamond around without much thought.

On the first of this month, the Museum of History and Technology opens an exhibit on atom smashers. These are the cyclotrons, synchrotrons and other circular track devices which increase the speed of subatomic particles until, when they collide, it's not just a fender-bender but a general disintegration. The first cyclotrons, in the early 1930s, were only a few inches in diameter and the research required to build them and experiment with them usually cost within four figures, according to notebooks and rough drafts of letters on display. Today, of course, the huge Fermilab synchrotron has a circumference of some four miles, and costs go to nine figures.

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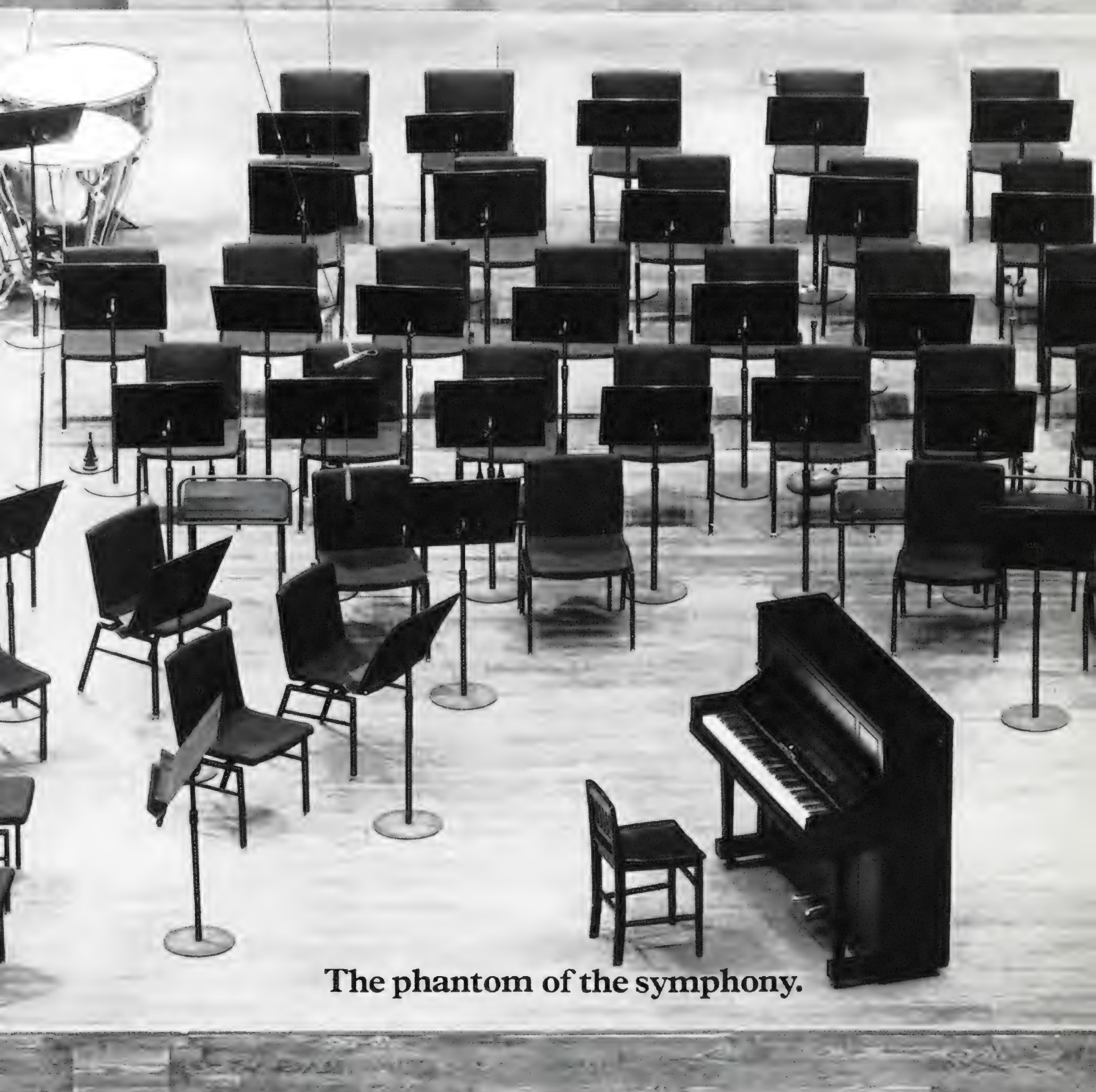

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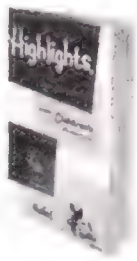

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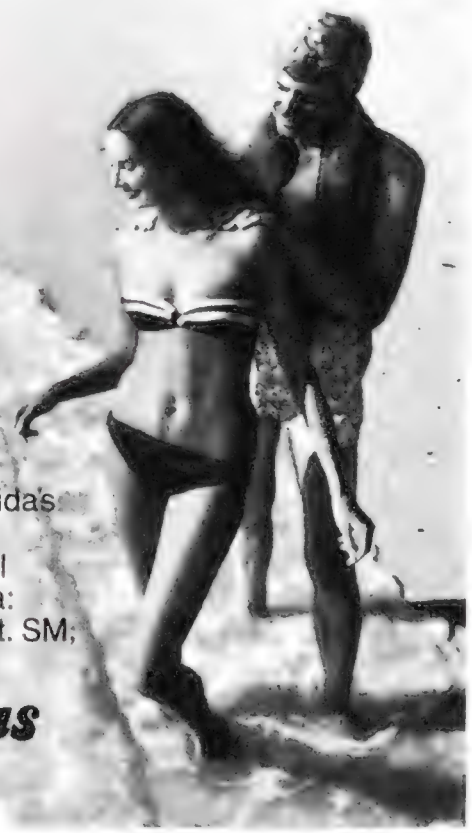

Marco Beach Hotel & Villas
The American tropical island.

I saw the exhibit being put together. Some of the hardware was in place—great shiny copper electromagnets and sections of cyclotrons—and display cases were being erected. The visitor is whisked from the 1930s to the 1970s, sensing the buildup of potential from the days when nuclear energy was esoteric, to be mentioned half-smiling in a college physics class, to today—when I, at least, cannot look at such hardware without considering the use of nuclear energy in our daily lives and in our future.

This is not your slick-and-easy walk-through exhibit, designed to show you all you need to know without demanding anything from you except leg muscles. Curator Paul Forman and his staff are not treating us viewers like children. I read some of the explanatory placards, and found that I had to go over them three times, which indicates that the visitor of average intellect may have to scan them twice. But it's a splendid exhibit, demanding and rewarding and significant, especially to those of us who can remember a little about those days of experimentation.

Years ago, in freshman physics, my professor, in a burst of Teutonic good humor brought about by a successful lab demonstration, noted that "vid dis adom-smashink der iss a danger of tchain reaction, und den ve get so much energy, Gott knows vat ve do vid it."

And when the A bomb that Herr Professor unwittingly foresaw was dropped on Hiroshima, my father's friend Slocum is said to have remarked that "one of these days ye'll go daown to breakfast and find that some damn fool has gone and blun up New Hampshire."

Last month I dipped into the problem of what makes a Frisbee do all the things it does, and I promised that there would be a complete report from the task force that our aeronautical engineer friend, Mel Zisfein, Deputy Director of the National Air and Space Museum, organized in order to answer an innocent question.

I have seen the report, listened to a presentation by Mel and Charles G. Barbely, the Institution's Number One Frisbee Expert, and decided that we have something really big, here, folks—too big to squeeze into this month's remaining space. Watch for the true story of Frisbees next month!

—EDWARDS PARK

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Alaska: develop or conserve?
Issue is moving toward a showdown

Our last terrestrial frontier is up for grabs as Congress tries to reconcile divergent views in a historic land bill

By Margot Hornblower

Photographs by Dennis Stock

Alaska. The ancient Aleut word means "Great Land" and, in the American mind, it evokes romantic visions of the last frontier, the gold rush, the oil boom, wolves, whales, Eskimos, sourdoughs and bush pilots, and the trackless tundra beyond the Arctic Circle. These images are not untrue to life. Alaska truly is the last virgin territory left in the United States.

Wildlife is found all over the state. Its indigenous peoples have evolved a culture rich and resourceful, unlike any other in the world. Its potential for outdoor recreation is incalculable. Yet it is also replete with oil, coal, gas, metals, minerals and timber, and development has already begun to leave its scars. So it is no surprise that the 49th state is the scene of the epic environmental battle of the century. Backpackers and bureaucrats, ecologists and geologists, energy experts and moose hunters, Natives and whites, Republicans and Democrats, Alaskans and lower-48ers have wheeled in their big guns on the issue of how to carve up this massive chunk of prime real estate.

Congress is struggling now to write an Alaska National Interest Lands Conservation Act which could, if passed in its most generous version, set aside nearly 115 million of the state's total 375 million acres for new national parks, forests, wildlife refuges and scenic and wild rivers. That, along with existing parks and refuges, could mean that 40 percent of Alaska would be preserved. For starters, the legislation could add at least the following scenic splendors to our national conservation system:

• Gates of the Arctic National Park: The 9,000-foot peaks of this mountain-studded wilderness park would

Conservationists want to expand park around 20,320-foot-high Mt. McKinley by 4.7 million acres.

Barrow
ARCTIC OCEAN
Prudhoe Bay
Point Hope
NORTH SLOPE
Colville River
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Mount McKinley
Kuskokwim River
Susitna River
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ALEUTIAN RANGE
KENAI PENINSULA
Seward
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0 100 200 300 Kilometers
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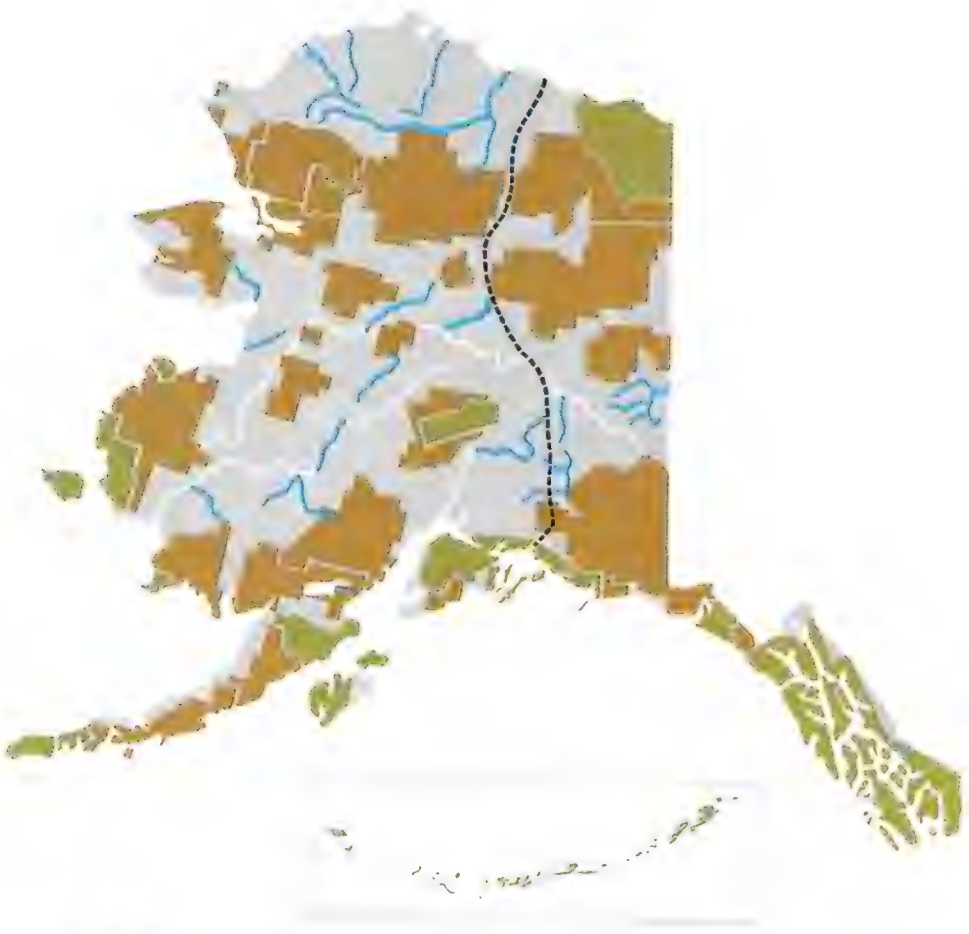


—existing national parks, wildlife refuges and national forests

—proposed maximum additions to parks, refuges and forests

—proposed wild and scenic rivers

Map, opposite, shows Alaska in summer; most of state, save for perpetually snow-capped peaks like Mt. McKinley, is depicted in seasonal shades. Dotted line on map above indicates oil pipeline. Aleutians (box) are now mostly wildlife refuge.

span the north and south slopes of the Brooks Range, the Arctic backbone of Alaska, a deserted area of desolate high country and wide, steep-walled valleys. Its rivers, with such indigenous names as Alatna, Noatak, Kobuk and Tinayguk, are among the nation's best for white-water rafting and canoeing. The area is populated with grizzly bears, wolves and moose. Caribou migrate through the steep mountain passes each spring and fall.

• Lake Clark National Park: Scores of turquoise lakes are scattered through this area where the Alaska and Aleutian mountain ranges collide 100 miles west of Anchorage. Spectacular glaciers and volcanoes border scenic hiking routes. Waterfalls splash down along some of the finest red salmon and rainbow trout streams and rivers in the world. Dall sheep and brown bears roam freely.

• Kobuk Valley National Park: An Arctic desert of 100-foot sand dunes along the flatlands of the Kobuk River, the park would include archaeological sites dating back 8,500 years. Canoeists float past Eskimo villages where fish dry on racks and caribou hides flap in the wind. Flocks of ptarmigan feed on river sandbars and beavers build dams along the streams.

• Wrangell-St. Elias National Park: Braided rivers meander through a rugged wilderness which includes the continent's greatest collection of peaks over 16,000 feet and its largest assemblage of glaciers. Spruce-forested mountains capped with snow taper off into the frigid, deep blue Gulf of Alaska. Peregrine falcons and bald eagles circle overhead. On a steep mountainside, the red Victorian buildings of an abandoned Kennecott copper mine recall a colorful, if destructive, episode of the past.

• Alaska Marine Resources National Wildlife Refuge: The rookeries, islands, spires and reefs of the southeast coast harbor 55 species of seabirds whose numbers mount into the millions. Sea lions, seals, sea otters, walruses, polar bears and 16 species of whales can be observed along this remote seascape.

• Aniakchak Caldera National Monument: The Aniakchak crater erupted in 1931, leaving a stark, dramatic caldera and 30 square miles covered with ash. The area is a living geology textbook of cinder cones and explosion pits. Lava flows nearly surround Surprise Lake, a bright green emerald in the middle of the crater. The Aniakchak River rushes down the caldera wall, then wanders 27 miles across rolling tundra to the Pacific.

The current debate is actually the third act of a

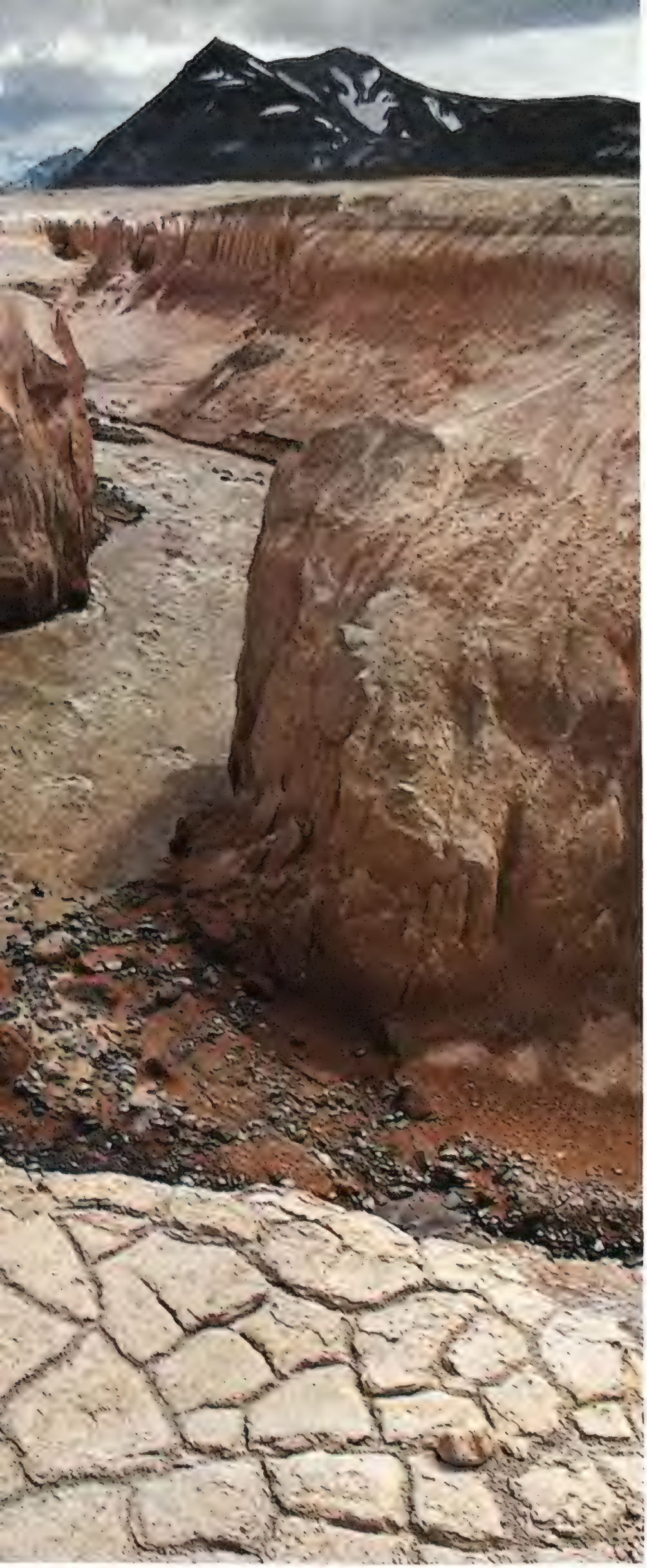
Margot Hornblower reports on environment, conservation and energy for the Washington Post. *Dennis Stock, the photographer, spent last summer in Alaska preparing a book on the state.*

drama that began when the Territory of Alaska became a state in 1959. At that time, Congress awarded the state 104.5 million acres (which it is still in the process of selecting), in addition to approximately 45 million acres of tidelands and coastal shelf. The federal government had held title to virtually all 375 million acres of Alaska up until then, having bought the land from Russia in 1867. Most observers thought Secretary of State William H. Seward had committed an egregious folly by throwing away $7.2 million on a gigantic "icebox."

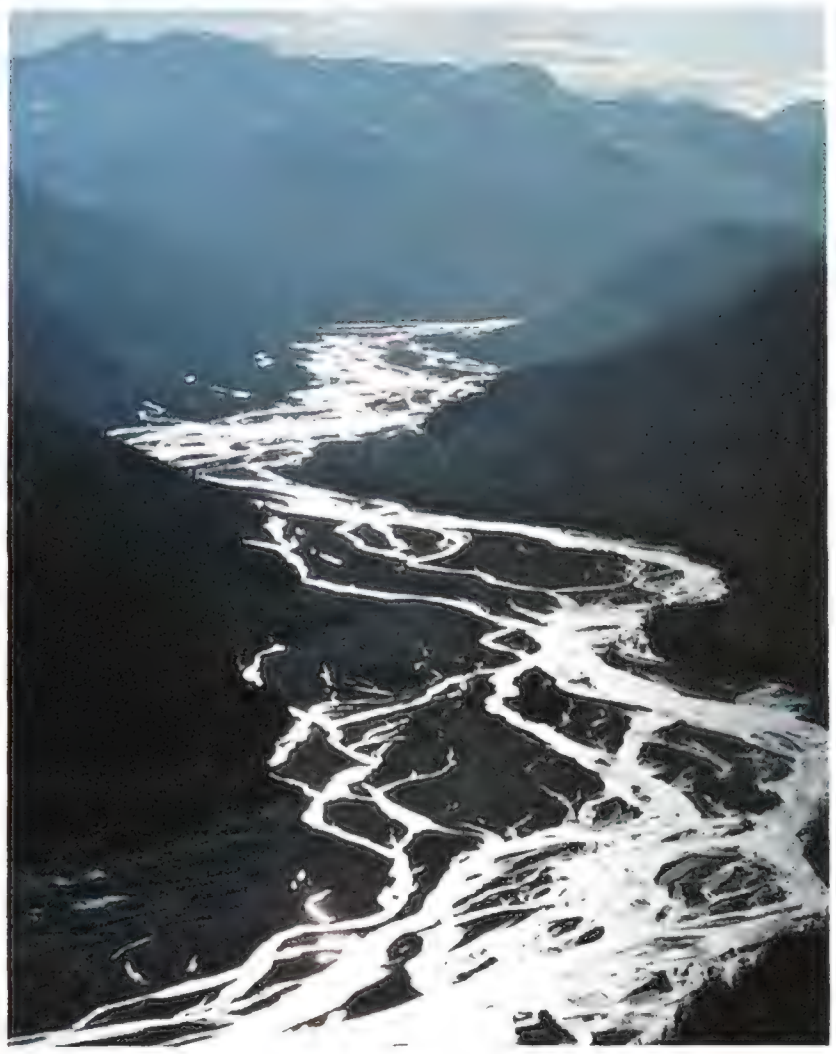
As the civil rights movement spread across the nation 15 years ago, Alaskan Natives began to complain that their aboriginal rights to the land had been abrogated. In 1966, Secretary of the Interior Stewart L. Udall imposed a freeze on all Alaskan land transfers, halting both state selections and private development until the Native issue was settled. When oil was discovered two years later at Prudhoe Bay, the Natives threatened to hold up the pipeline unless their demands were met. The resulting Alaska Native Claims Settlement Act of 1971 gave the Eskimos, Aleuts and Indians claim to 44 million acres in a second major division of the state and, almost by chance, set the stage for the present controversy. Only at the last minute, during House-Senate conference committee wrangling, was an amendment added to the act directing the Secretary of the Interior to set aside up to 80 million acres for possible designation as new national parks and forests, wildlife refuges, and scenic and wild rivers. It also stipulated that by December 18, 1978, Congress must enact legislation to give these "national interest" lands permanent protection. The amendment became Section 17 (d)(2) of the 1971 act, and the "D2 lands" were thus christened.

Statistics can only hint at the immensity and grandeur of Alaska: the largest state in the union and a

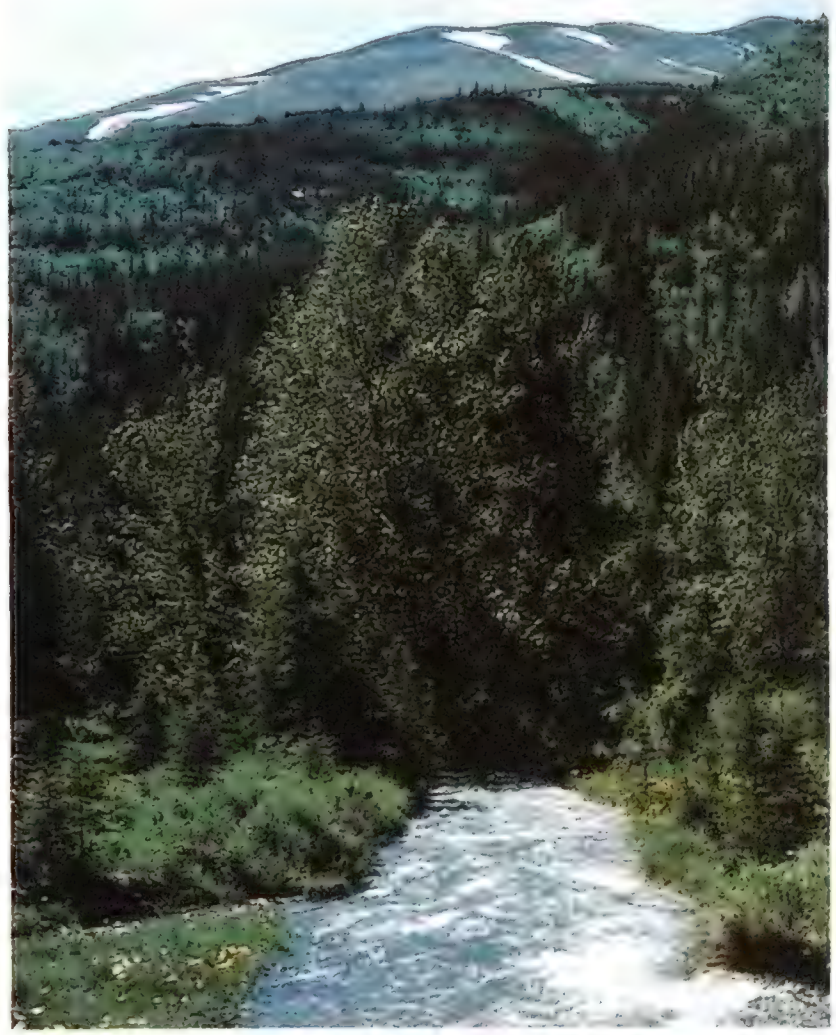
Pumice ash blankets steaming vents and fissures of Katmai Monument's Valley of Ten Thousand Smokes.



National Interest Lands bill would add acreage to ensure survival of brown bears in this habitat.

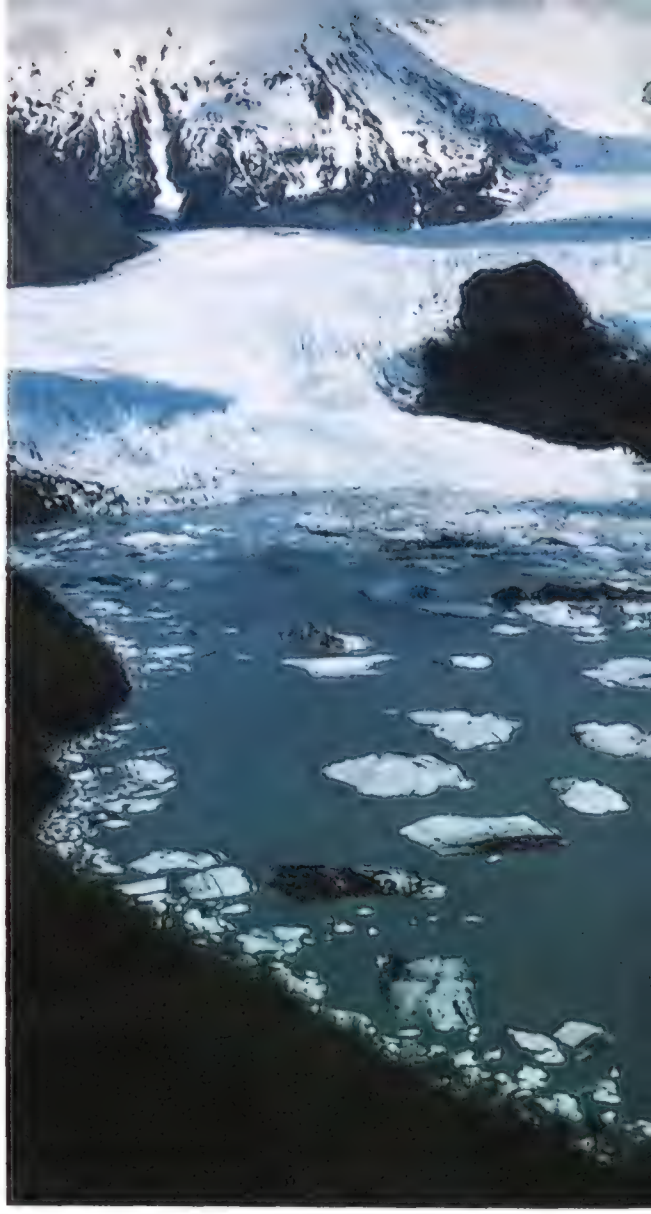


Tlikakila River threads through Lake Clark area, a proposed park one hour from Anchorage.



Russian River on Kenai Peninsula. Here, in season, salmon fishermen are shoulder to shoulder.

The Aleutian Islands already harbor a wildlife refuge and could now be designated a wilderness area.



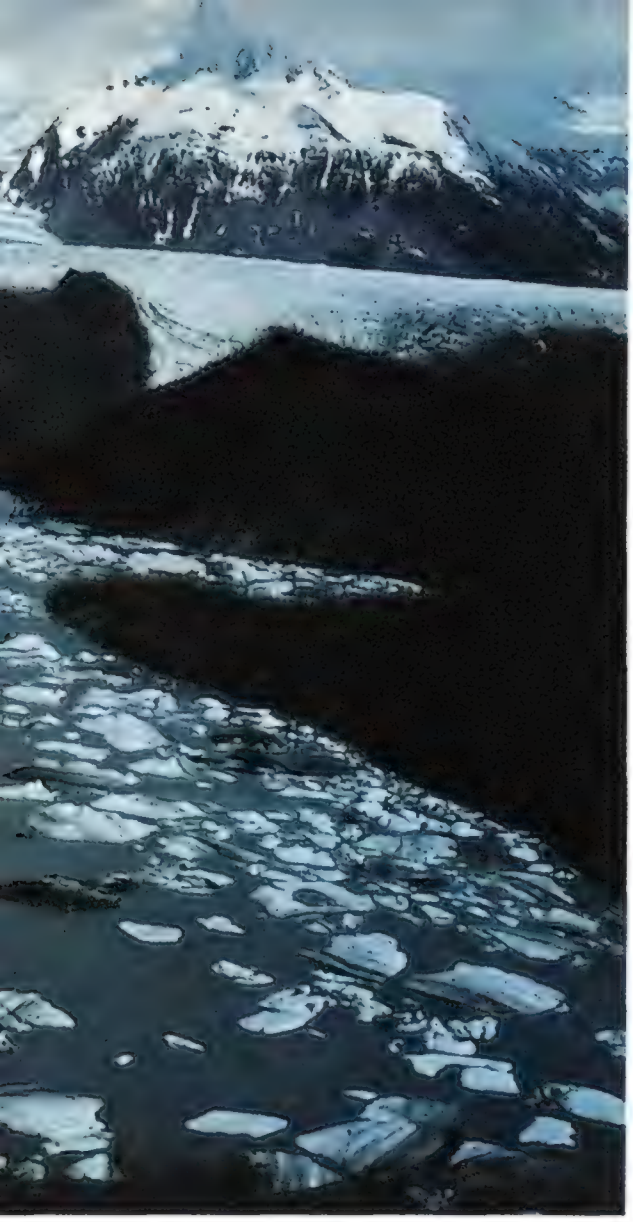
Fjords of Glacier Bay National Monument are nominated for park

fifth the extent of the continental United States, Alaska spans five time zones. It boasts our highest mountains, our longest scenic rivers, more than half of our coastline, most of our remaining wildlife. The parks proposed under D2 would more than double the size of our National Park system. One would be six times as big as Yellowstone, now the nation's largest park, and contain a glacier the size of Rhode Island. A single offshore island proposed for wilderness protection shelters more bald eagles and grizzly bears than the other 49 states combined. Yet the vastness of this semicontinent is virtually unpopulated. Fewer people —about 400,000—live there than in the District of Columbia. It is served by only 2,744 miles of paved road, about the same number as the District and Montgomery County, Maryland, combined. In all of Alaska, about 160,000 acres have been cleared, settled or altered by man—less than .001 of a percent of the total acreage.

What's left is a primeval wilderness, the only part of America almost as uncluttered and untouched as before the white man arrived on these shores. In this northern wonderland, the nation's most spectacular scenery sits atop its richest mineral deposits and fossil fuels. The stakes are immense. The demand for outdoor recreation and natural solitude is growing even faster than population. But, as the Arab oil embargo reminded us a few years ago, the United States is also running low on oil and gas while our appetite for energy steadily increases. Estimates vary, but the U.S. Geological Survey has reported that Alaska contains 6 to 19 billion barrels of "undiscovered" oil and 16 billion barrels of proven reserves, plus 16 to 57 trillion cubic feet of undiscovered natural gas and 46 trillion cubic feet of proven reserves. Alaska also contains substantial coal resources (mostly inaccessible for lack of transportation) and large deposits of nickel, copper and chromium, the latter now supplied mainly by South Africa, Turkey and the Soviet Union. In this competitive world, many question whether we can afford just to sit on these critical supplies.

Yet everyone agrees that some of Alaska's natural beauty and recreational potential must be saved. The question is, how much of it?

Representative Morris K. Udall of Arizona, chairman of the House Interior Committee, and 80 cosponsors introduced the bill, referred to earlier, which would set aside 115 million acres for 13 new or expanded national parks, 14 wildlife refuges and 23 wild and scenic rivers. Drawn up by the Alaska Coalition, which includes the nation's major environmental organizations, the bill has generated much contro-



status. Waters still host many whale species, in depleted numbers.

Tidal mud flats at Homer, a town on Kachemak Bay, noted for its rich harvest of King and Snow crab.

versy. Many state residents, especially politicians, businessmen and organized labor, would leave disposition of D2 lands to the play of the market.

In the Carter administration, the Alaska lands issue caused a confrontation between Interior Secretary Cecil D. Andrus, an environmentalist, and the staff of the new Energy Secretary, pragmatic James R. Schlesinger. His staff claimed that adding the 8.85-million-acre Arctic National Wildlife Range to the official wilderness system would rule out development of one of the largest potential onshore petroleum fields in America, with possible proven reserves of between 6 and 16 billion barrels of oil. The conflict was resolved by President Carter, who agreed with Secretary Andrus that the refuge contains irreplaceable wildlife habitat, especially for the Porcupine caribou herd, which comprises 120,000 animals.

The administration's D2 proposals would set aside 91.7 million acres—an area larger than the New England states plus New York and New Jersey—for parks, wildlife refuges, wild and scenic rivers and national forests. The Carter package is larger than Richard Nixon's 1973 proposal for 83 million acres, and it avoids some of the compromises his Interior Secretary, Rogers C. B. Morton, went on to make with the development interests. It would add 41.7 million acres to the National Park system, creating ten brand-new parks and three major additions to existing units. It would increase the National Wildlife Refuge system by 45.1 million acres, including nine new and five expanded refuges. Thirty-three scenic rivers would be protected from development and 2.5 million acres would be added to the National Forest system.

Congressman Udall's original bill would have set aside 23 million more acres than the Carter administration, but committee staff has pared that down, and the new version probably will recommend about 102 million acres. The Udall bill also designated all the D2 lands as federally protected wilderness, thus prohibiting the kind of commercialism that has taken place elsewhere. However, some citizens have protested so vociferously against the wilderness provision that the final committee bill is likely to include a compromise allowing motorboats, small aircraft and perhaps even some roads in the new parks.

On the opposite side, Senator Ted Stevens, wanting what he calls a more diversified land-use policy, would set aside only 10 million acres of parks, 8 million acres of refuges, 5.7 million acres of national forests and three wild rivers. In addition, 57 million acres, called "Federal Cooperative Lands," could be classified in the future by a federal-state commission. This commission

would comprise four gubernatorial appointees and four named by the President.

Underlying the confusing battle of acreage figures and boundaries is the role of complete ecosystems in the conservation of natural resources. National park boundaries in the lower 48 have often been gerrymandered by political compromise, with little scientific attention to the natural systems needed to sustain complex life communities, or biomes. As in the case of the California coastal redwoods threatened by logging and destruction of watershed, the government has frequently found itself, years after a park was originally established, having to buy up increasingly expensive land around its borders to protect it from destruction. Conservationists view Alaska as the last opportunity to set aside enough land—in some cases, the entire range of a caribou herd or a whole river watershed—before the developers get there. Once developed, it's gone for good.

Complete ecosystems are vital

"In general," says David Brower, the president of Friends of the Earth, an activist group, "we would like to call for a second purchase of Alaska, so that it may treat as many people as possible, for as long as possible, to the unique beauties it possesses, almost as if it were a separate little planet, brought alongside and made available to us in trust."

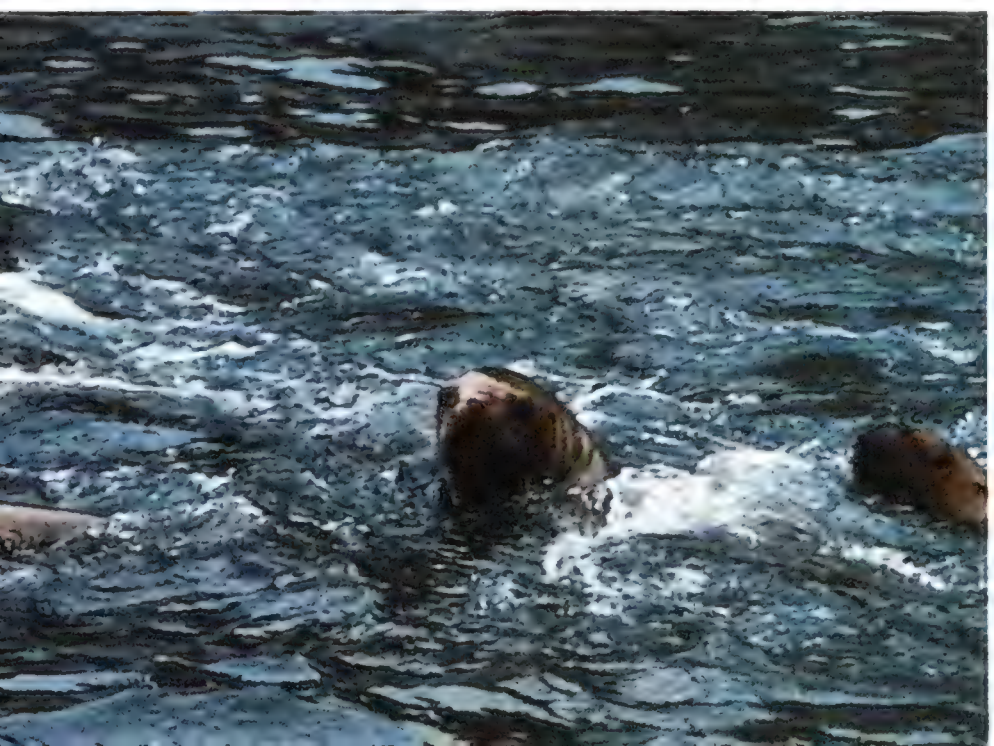
The landscapes of Alaska's parks are remarkably varied: lush rain forests, tundra prairies, marshy delta flatlands, arid zones and endless mountain ranges. Entire ecosystems like these are needed, according to Cynthia Wayburn of the Sierra Club, because Alaska "is still a place where a grizzly bear can roam the way his species has roamed for thousands of years. One barren-ground grizzly bear needs 100 square miles just to feed itself and rear its young. If you draw a line halfway through that ecosystem and only permit the bear 50 square miles, it will die. If you draw a line halfway across a river's course and say, 'We will protect the lower half of this river and exploit the upper half,' then you destroy the river and it's a joke to call that preservation." The scientific community agrees.

Biologists confirm that parks and refuges in Alaska must be considerably larger than in the lower 48 states because the land is so fragile and relatively unproductive. The growing season on the North Slope lasts but a few summer weeks, spreading a thin film of life over the dark permafrost. A spruce tree only a few feet tall may be 50 years old. The lichens that caribou munch in winter take 20 to 40 years to recover after a fire. So sparse is vegetation and animal life that a wolf may travel 60 miles for a single meal. Comparing ecologically equivalent species, Herbert Melchior,

Mt. McKinley park's two-million-acre expanse must be enlarged to accommodate wide-ranging caribou.

This Canada goose and goslings try to adapt to human presence at a state refuge south of Anchorage.

A Kenai Fjords National Monument would let these sea lions practice their breaststroke in perpetuity.



a University of Alaska scientist, testified before an Interior subcommittee that Vermont supports 250,000 white tail deer on 9,000 square miles—about 28 per square mile. In Alaska, however, the western Arctic caribou herd, at its peak population of 250,000, requires a range of 140,000 square miles to survive—less than two per square mile.

The Alaska lands have aroused unprecedented public interest. More than 2,000 witnesses have testified, the majority of them in favor of the Udall bill, at Congressional hearings this year in Washington, Chicago, Atlanta, Seattle, Denver, Anchorage, Fairbanks, Sitka, Juneau, Ketchikan and smaller Alaskan towns. Virtually every major national environmental group has made saving the state a top priority.

Representative John F. Seiberling of Ohio, chairman of Interior's General Oversight and Alaska Lands Subcommittee, has led more than a dozen Congressmen on inspection trips around the state. After a tour of southeast Alaska in July, he reported to the House that every member came back exhilarated by the breathtaking beauty of the place. Seiberling, an otherwise low-keyed type, seems ready to burst when he talks about the state. "Everywhere else, Man has so altered the land that the original patterns are lost forever. Nowhere else but Alaska can one see clearly the hand of the Creator."

Safeguarding a national patrimony

Even among those who have never visited the state, the D2 issue has aroused unusual passions. Perhaps it is because, as Fairbanks conservationist James Kowalsky has written, "Most Alaskans and non-Alaskans alike identify with an idealized Alaska . . . where wisps of smoke from a wood fire drift from the chimney of a trapper's log cabin buried under five feet of snow at 60 below zero . . . where fish wheels and drying racks and tanning hides and curing meat tell us that indigenous cultures still exist. . . ."

But there is another Alaska—one barely born, a vision of future gas pipelines, offshore drilling rigs, copper mines, coal tipples, airports, shopping centers, bars, burger joints and highways, progress and wealth rising from the wilderness—the taming of the West all over again. Oil, timber and mining companies, the state legislature and the Congressional delegation all fear that the state's rich commercial resources will be "locked up" by the Udall and Carter proposals, further aggravating energy shortages and unemployment in the rest of the country. The dilemma caused Alaska's governor, Jay Hammond, to lament that "it is not easy to be both oil barrel to the nation and national park to the world."

An outspoken opponent of the conservationists,

A pre-1867 Russian Orthodox church is dwarfed by actively volcanic Mt. Redoubt near Cook Inlet.

Alaska's lone congressman, Don Young, says the Udall bill amounts to "colonial rule from Washington, D.C." and is favored mainly by "a well-organized, very vocal minority." According to Young, "These vast, arbitrary designations [of parks and wilderness areas] will have a disastrous impact. State and Native lands will have very little value because there won't be access across federal lands. Ninety percent of the state's hydropower sites will be eliminated. There's very little recreation in wilderness areas, only for the select few, mainly the young." He will fight the bill to the end.

As Jack Carlson, a U.S. Chamber of Commerce representative in Washington, puts it, "Why tie our hands and punish ourselves by locking up our resources now? . . .If [the Udall bill] becomes law, many or most of those resources will not be discovered, will not be developed, will not be produced. . . ."

Joining in the chorus of complaints against the D2 bill are Alaska's sport hunters. An annual moose, a harvest of ducks, and maybe a Dall sheep from time to time—these are considered constitutional rights by most male residents of the state. However, both the Udall and Carter bills would prohibit sport hunting in most new park areas and, even on federal lands open to sport hunting, "subsistence" hunting, mainly by the Natives, would have preference. The reaction of many sport hunters to the proposed transfer of wildlife management from state to federal authorities was best expressed by the Alaska Wildlife Federation and Sportsmen's Council: "It is one more of hundreds of sad cases where some bigoted ass in Washington 'decides' for the poor dumb colonists out on the frontier. . . . We thought statehood relieved us of such painful insults and . . . the emasculation of our rights as equal citizens under the American flag."

But Alaska's 60,000 Natives constitute a powerful lobbying group, generally allied with conservationists. They want Congress to guarantee subsistence hunting on federal lands—not just in certain zones as Udall has proposed. The 200 Indian and Eskimo villages in the remote Alaskan bush are, for the most part, cut off from regular transportation and unable to attract employers. Food stamps provide uncertain support, since groceries are twice as expensive as in the lower 48, and village stores get no airborne provisions during bad weather. Hunting and fishing for many Natives are not only the basis of their culture, but a nutritional necessity. Salmon dried in the fall feeds a family all winter long. A moose or seal is often shared around the village in communal ritual. "We've got to go out," said Eskimo leader Axel Johnson of the Yukon River village of Emmonak. "We either hunt or die."

Johnson and hundreds of Natives who testified at hearings this summer say the state favors sport hunting and sets arbitrary rules limiting subsistence hunting. By and large, Natives would welcome expanded federal control, so long as it allows them to hunt and fish with motorboats and snowmobiles—a putative necessity during long Alaskan winters when the game is sparse and scattered. They are also concerned that large federal parks not cut off their land, part of which will be commercially developed, from access to modern ports and highways.

Thus, a dozen different constituencies are lobbying frantically as Congress hammers out the boundaries and acreage of Alaska's wild lands. Congress probably will not pass a final bill before this spring but, in the meantime, as required by our system, it will be weighing the relative values of a short-to-medium term need for the resources which can be developed, and the esthetic and spiritual wonders of the state which, in the best of worlds, should be protected. It can and will be argued that this may be our last chance to practice our stewardship of the land on a nearly continental scale. If we blow it, there may not be a second chance, as the condition of the American environment today demonstrates. A preservationist approach might best serve even the economic interests, for the potential of Alaska as a place for controlled tourism and recreation could, in the long run, far exceed the value of its mineral wealth. Oil and copper are exhaustible, but natural beauty is a boon for generations to come.

Alyeska Pipeline, first big development, pumps 600,000 barrels of crude oil per day into tankers at Valdez.

A suppressed adventure of 'Alice' surfaces after 107 years

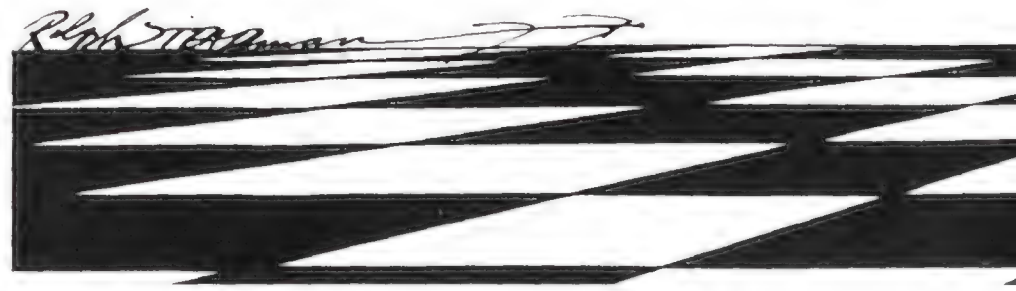
At the urging of his illustrator, Lewis Carroll omitted this whole 'Wasp-in-a-Wig' episode of Through the Looking-Glass

Three generations of adults and children reading and loving *Alice's Adventures in Wonderland* and *Through the Looking-Glass* have assumed that author Lewis Carroll held back nothing from them. Not so. Carroll—pen name of Charles Lutwidge Dodgson—suppressed a whole *Looking-Glass* episode that has only recently come to light. The actual galley proofs, or slips as they were called in his time, are reproduced, starting at right, with Carroll's 1870 proofreading marks in the margins.

The suppression was in deference to Carroll's talented but demanding illustrator, John (later Sir John) Tenniel. He objected to the episode's subject matter. Not that it was salacious—Carroll never would have committed anything of that sort to paper—but it dealt with Alice's encounter with an elderly wasp in a wig (see cover). And so far as the artist was concerned, he told Carroll, "a *wasp* in a *wig* is altogether beyond the appliances of art." Some modern artists (at right and on following pages) have not found the challenge beyond them at all.

The suppressed episode is not the only *Alice* "dishcovery" of the year. At the instigation of an American professor, conservators at the British Museum held up to the light the last page of the original *Alice* manuscript. Morton N. Cohen, member of the City University of New York faculty and editor of Lewis Carroll's letters, to be published in 1978, had long suspected what they would see: behind Carroll's pasted-down photograph of 11-year-old Alice Liddell was Carroll's own drawing of the girl (p. 56). It had been hidden there 113 years.

In the "waspish" narrative on these pages, Alice is in her dreamworld. She has stepped through the mirror over the family mantel and become a pawn in a live chess game. She has met the Red Queen, the White Queen, Tweedledum and Tweedledee, Humpty



and she was just going to spring over, when she heard a deep sigh, which seemed to come from the wood behind her.

"There's somebody *very* unhappy there," she thought, looking anxiously ~~and she went a little way~~ back ~~again~~ to see what was the matter. Something like a very old man (only that his face was more like a wasp) was sitting on the ground, leaning against a tree, all huddled up together, and shivering as if he were very cold.

omit to middle of Slip 68

Above and on the cover, British artist Ralph Steadman portrays Alice's encounter with an elderly wasp. Steadman is one of four illustrators who tried a hand at capturing the irascible insect.

64

"I don't *think* I can be of any use to him," was Alice's first thought, as she turned to spring over the brook:——"but I'll just ask him what's the matter," she added, checking herself on the very edge. "If I once jump over, everything will change, and then I can't help him."

So she went back to the Wasp——rather unwillingly, for she was *very* anxious to be a Queen.

"Oh, my old bones, my old bones!" he was grumbling on, as Alice came up to him.

"It's rheumatism, I should think," Alice said to herself, and she stooped over him, and said very kindly, "I hope you're not in much pain?"

The Wasp only shook his shoulders, and turned his head away. "Ah, deary me!" he said to himself.

"Can I do anything for you?" Alice went on. "Aren't you rather cold here?"

"How you go on!" the Wasp said in a peevish tone. "Worrity, worrity! There never was such a child!"

Alice felt rather offended at this answer, and was very nearly walking on and leaving

THE WASP IN A WIG © 1977 by Philip Jaques and Elizabeth Christie, trustees of the estate of C. L. Dodgson, published in the U.S. by Clarkson N. Potter, Inc. Galley proofs by permission of Norman Armour jr. and the Lewis Carroll Society of North America.

Self-portrait of the formidable John Tenniel, illustrator at whose behest the episode was killed.

Lewis Carroll (pen name of C.L. Dodgson) sat for this photographic portrait in 1863.

Dumpty, the Lion and the Unicorn and, in Chapter VIII, The Red and White Knights. The latter promises that after she crosses the next brook she, too, will become a Queen. "A very few steps brought her to the edge of the brook," and then came the suppressed episode. The published *Looking-Glass* went on as if the missing lines had never been there.

Now a chapbook and a limited hard-cover edition of *The Wasp in a Wig*, with notes and an introduction by the Carroll scholar Martin Gardner, producer of *The Annotated Alice*, have been published by the Lewis Carroll Society of North America (Clarkson N. Potter will publish a trade edition in the spring of 1978). In it Gardner notes that Carroll left no final record of his own opinion of the episode or the 20-line poem (p. 55) it included. But he did preserve the galleys. After his death in 1898, they were bought by an unknown collector.

Three-quarters of a century later, Sotheby Parke Bernet, the auctioneers, listed the following item in their London catalog for June 3, 1974:

"Dodgson (C. L.) 'Lewis Carroll.' Galley proofs for a suppressed portion of 'Through the Looking-Glass,' slip 64-67 and portions of 63 and 68, with autograph revisions in black ink and note in the author's purple ink that the extensive passage is to be omitted.

"The present portion contains an incident in which Alice meets a bad-tempered wasp, incorporating a poem of five stanzas, beginning 'When I was young, my ringlets waved'. . . . The proofs were bought at the sale of the author's furniture, personal effects, and library, Oxford, 1898, and are apparently unrecorded and unpublished."

"The property of a gentleman" was all the Sotheby catalog had to say about the previous ownership. The offering was exciting to manuscript dealers and one of them, John Fleming of New York, bid in the galleys

him, but she thought to herself "Perhaps it's only pain that makes him so cross." So she tried once more.

"Won't you let me help you round to the other side? You'll be out of the cold wind there."

The Wasp took her arm, and let her help him round the tree, but when he got settled down again he only said, as before, "Worrity, worrity! Can't you leave a body alone?"

"Would you like me to read you a bit of this?" Alice went on, as she picked up a newspaper which had been lying at his feet.

"You may read it if you've a mind to," the Wasp said, rather sulkily. "Nobody's hindering you, that *I* know of."

So Alice sat down by him, and spread out the paper on her knees, and began. "*Latest News. The Exploring Party have made another tour in the Pantry, and have found five new lumps of white sugar, large and in fine condition. In coming back——*"

Alice put down the newspaper. "I'm afraid you're not well," she said in a soothing tone. "Can't I do anything for you?"

"It's all along of the wig," the Wasp said in a much gentler voice.

"Along of the wig?" Alice repeated, quite pleased to find that he was recovering his temper.

"You'd be cross too, if you'd a wig like mine," the Wasp went on. "They jokes at one. And they worrits one. And then I gets cross. And I gets cold. And I gets under a tree. And I gets a yellow handkerchief. And I ties up my face——as at the present."

Alice looked pityingly at him. "Tying up the face is very good for the toothache," she said.

"And it's very good for the conceit," added the Wasp.

Alice didn't catch the word exactly. "Is that a kind of toothache?" she asked.

The Wasp considered a little. "Well, no," he said: "it's when you hold up your head——

"Any brown sugar?" the Wasp interrupted.

Alice hastily ran her eye down the paper and said "No; it says nothing about brown."

"No brown sugar!" grumbled the Wasp. "A nice exploring party!"

"*In coming back,*" Alice went on reading, "*they found a lake of treacle. The banks of the lake were blue and white, and looked like china. While tasting the treacle, they had a sad accident: two of their party were engulphed——*"

"Were *what?*" the Wasp asked in a very cross voice.

"En-gulph-ed," Alice repeated, dividing the word into syllables.

"There's no such word in the language!" said the Wasp.

"It's in this newspaper though," Alice said a little timidly.

"Let it stop there!" said the Wasp, fretfully turning away his head.

Sir Hugh Casson, president of Britain's Royal Academy, drew Alice and the Wasp like this and said, "To have a go was irresistible and I enjoyed every minute and every stroke."

Patrick Procktor, admirer of Tenniel, drew this version, but said "I am terrified of wasps."

for $4,000, for an anonymous client. Again the galleys disappeared from sight, but when Martin Gardner wrote the client in care of Fleming, he received a reply from Norman Armour jr. of New York. And, in time, Armour gave permission for publication.

Scholars have not agreed about the literary merit of the suppressed material, or whether it is indeed a whole chapter or just an episode from one. However, no student of *Alice* would go so far as to say the work would have been better off undiscovered. Generally they feel that, as raw Carroll goes, it is splendid stuff. The author liked to fiddle and fuss with his writing long after it was in first proof. Yet Carroll's inventiveness shows through brightly in this unrevised copy, as in the passage where Alice reads to the venerable insect from a newspaper for wasps. Likewise, Carroll's facility for playing on words—such as a comb for hair versus a honeycomb. His flair for rhyming is here, too, in the pathetic autobiographical poem recited to Alice by the grumpy wasp.

And the gift for characterization is as remarkably robust here as anywhere in Carroll's writing. The wasp is an ancient, irascible, lower-class figure, unlike many of the characters in the two books. He is not particularly grateful for Alice's attentions, and, while harmless enough—male wasps, in fact, are incapable of stinging—there are barbs in almost everything he says.

As Martin Gardner points out, "Although the Wasp continues to criticize, when Alice leaves him she is 'quite pleased that she had gone back and given a few minutes to making the poor old creature comfortable.' Carroll surely must have wanted to show Alice performing a final deed of charity that would justify her approaching coronation, a reward that Carroll, a pious Christian and patriotic Englishman, would have regarded as a crown of righteousness. Alice comes through as . . . an admirable, appealing little girl. . . ."

so——without bending your neck."

"Oh, you mean stiff-neck," said Alice.

The Wasp said "That's a new-fangled name. They called it conceit in my time."

"Conceit isn't a disease at all," Alice remarked.

66

"It is though," said the Wasp: "wait till you have it, and then you'll know. And when you catches it, just try tying a yellow handkerchief round your face. It'll cure you in no time!"

He untied the handkerchief as he spoke, and Alice looked at his wig in great surprise. It was bright yellow like the handkerchief, and all tangled and tumbled about like a heap of sea-weed. "You could make your wig much neater," she said, "if only you had a comb."

"What, you're a Bee, are you?" the Wasp said, looking at her with more interest. "And you've got a comb. Much honey?"

"It isn't that kind," Alice hastily explained. "It's to comb hair with——your wig's so *very* rough, you know."

"I'll tell you how I came to wear it," the Wasp said. "When I was young, you know, my ringlets used to wave——"

A curious idea came into Alice's head.

Almost every one she had met had repeated poetry to her, and she thought she would try if the Wasp couldn't do it too. "Would you mind saying it in rhyme?" she asked very politely.

"It aint what I'm used to," said the Wasp: "however I'll try; wait a bit." He was silent for a few moments, and then began again—

"When I was young, my ringlets waved
And curled and crinkled on my head:
And then they said 'You should be shaved,
And wear a yellow wig instead.'

"But when I followed their advice,
And they had noticed the effect,
They said I did not look so nice
As they had ventured to expect.

"They said it did not fit, and so
It made me look extremely plain:
But what was I to do, you know?
My ringlets would not grow again.

"So now that I am old and gray,
And all my hair is nearly gone,
They take my wig from me and say
'How can you put such rubbish on?'

"And still, whenever I appear,
They hoot at me and call me 'Pig!'
And that is why they do it, dear,
Because I wear a yellow wig."

"I'm very sorry for you," Alice said heartily: "and I think if your wig fitted a little better, they wouldn't tease you quite so much."

"*Your* wig fits very well," the Wasp murmured, looking at her with an expression of admiration: "it's the shape of your head as does it. Your jaws aint well shaped, though—— I should think you couldn't bite well?"

Alice began with a little scream of laughing, which she turned into a cough as well as she could: at last she managed to say gravely, "I can bite anything I want."

"Not with a mouth as small as that," the Wasp persisted. "If you was a-fighting, now ——could you get hold of the other one by the back of the neck?"

"I'm afraid not," said Alice.

"Well, that's because your jaws are too short," the Wasp went on: "but the top of your head is nice and round." He took off his own wig as he spoke, and stretched out one claw towards Alice, as if he wished to do the same for her, but she kept out of reach, and would not take the hint. So he went on with his criticisms.

Omit

"Then your eyes——they're too much in front, no doubt. One would have done as well as two, if you *must* have them so close——"

Alice did not like having so many personal remarks made on her, and as the Wasp had quite recovered his spirits, and was getting very talkative, she thought she might safely leave him. "I think I must be going on now," she said. "Good-bye."

"Good-bye, and thank-ye," said the Wasp, and Alice tripped down the hill again, quite pleased that she had gone back and given a few minutes to making the poor old creature comfortable.

Peter Blake, Royal Academy associate, treated the subject "in the style of the time rather than in the style of Tenniel. However, I played the part and wrote notes on the drawing as though Tenniel had done it." Notes (not shown here) were descriptive phrases from text.

Alice's beauty—and her persuasiveness—were irresistible

Courtesy British Library Board

Dodgson pasted his photo of Alice over his drawing of her (above) in original manuscript he gave her.

Besides being spunky and adventurous, Alice Liddell, daughter of a dean at Oxford, was a beautiful child and a persuasive one as well. After Dodgson and another don took her and her two sisters to a picnic on July 4, 1862, she talked Dodgson into writing the story he told them. In a hand-printed version he called *Alice's Adventures Under Ground,* he did. With her photograph—taken by him—pasted onto the back page, it went to Alice. She was 75 when it was sold at auction in 1928, to an American buyer. Twenty years later it wound up in the British Museum. But for all of 113 years—until Morton Cohen urged a closer inspection—few suspected that under the photograph was Dodgson's drawing of Alice. It is easy to see why he placed one over the other.

With Mrs. George MacDonald and children, Dodgson posed for picture he may have taken himself. Her husband probably convinced him to publish "Alice."

Alice at age 8, winsome in her crown of flowers, was photographed in 1860 by the Oxford don who was later to immortalize her in his classics.

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A Soviet scientist measures a deep-frozen baby mammoth found last summer in Siberia. Some 9,000 to 12,000 years old, it is the first complete mammoth find not ruined by scavengers or dogs.

By John Massey Stewart

Frozen mammoths from Siberia bring the Ice Ages to vivid life

Discovery last summer of a fully preserved baby fills in history of the Pleistocene giants who added a word to our language

One day last June, a Soviet bulldozer operator was at work in a remote mountainous province of northeastern Siberia. He was one of a free-lance team of prospectors searching for gold along the sides of the little Kirgilyakh stream, ultimately a tributary of the river Kolyma which flows into the Arctic Ocean.

His work was monotonous, scooping up the surface layer of mud thawed from the eternal permafrost, permanently frozen ground, during the brief, hot summer. When therefore he noticed a polygonal block of muddy ice containing a curious dark mass, he was intrigued. Knowing that no spade or pick could wrest it from the permafrost's rock-hard grip, he turned to the attested local method and diverted the stream to thaw out the ice. Soon he was astounded to see, appearing through the frozen block, the contours of a baby mammoth.

From time to time parts of mammoths—besides innumerable bones—have been discovered preserved in the permafrost, but only once before, in Alaska, any remains of a baby mammoth. Only four essentially complete mammoths have been reported prior to the 20th century, and in each case the corpse had decomposed or been eaten by predators or natives' dogs before any scientist could reach the spot. Even Siberia's famous Berezovka mammoth, excavated in 1901, was not intact, as commonly assumed, but was missing some of its skin, bones, flesh and internal organs. So this find on the Kirgilyakh is not only the

Familiar with Siberia and the Far East, Mr. Stewart last wrote in SMITHSONIAN *(February 1976) on ginseng. A free-lance writer, he lives in London.*

Soviet expedition members provide the scale for a mammoth tusk weighing more than 185 pounds found along the shore of the Laptev Strait in Siberia. Man at left holds formidable leg bone.

first discovery of a complete mammoth since 1839, but the first complete mammoth ever to be rescued for science. An incredible opportunity to study a perfectly preserved mammal of the Pleistocene era!

"Dima"—as the gold prospectors christened their historic find—was flown the 300 miles southeast to the branch of the Soviet Academy of Sciences in Magadan on the Pacific coast and there placed in a special refrigerated chamber.

Among the first to be alerted was Professor Nikolai Vereshchagin of the Zoological Institute in Leningrad on the other side of the USSR. Vereshchagin, a quiet, scholarly man in his early sixties, a keen amateur fisherman and great-nephew of the famous 19th-century Russian painter of the same name, is chairman of the Academy's Committee for the Study of Mammoths and regarded as the world's foremost authority on these Ice-Age elephants.

At once he and other specialists set off by air to Magadan where, working with the local scientists, they began preliminary investigations. They found that Dima had chestnut-colored hair, measured 45 inches long and 41 inches high, had tiny ears and a 22-inch trunk with the two distinctive "fingers" at its end that appear in Stone-Age cave paintings.

It had died at the age of six months, probably by falling into a bog or small lake, and had been frozen for 9,000 to 12,000 years, with the smallest details preserved so perfectly that even its blood and protein can be analyzed.

Mammoths turn up everywhere

Dima has now been flown to Vereshchagin's institute in Leningrad, accompanied with a veterinary certificate because of anxieties about bacteria which could still be alive after being frozen for 9 to 12 millennia. After six months' investigation by many scientists from different institutes, the baby mammoth's skin will be stuffed and placed in the adjoining zoological museum, probably next to the Berezovka mammoth, until now the star attraction of all the museum's 40,000 exhibits.

The Berezovka River, another tributary of the Kolyma, lies nearly 400 miles northeast of the baby mammoth site. Here in the summer of 1900 the dog of a native hunter, scenting raw meat, led its master to a mammoth corpse protruding from the ground. The hunter was afraid, for many Siberian native peoples regarded the mammoth with superstition, believing it to be a gigantic rat or mole living underground. What else would explain the appearance of half-buried bones or carcasses of creatures not otherwise seen above ground?

Two bolder natives, however, chopped out the sur-

High-pressure hose frees mammoth bones from the rock-solid frozen banks of the Berelyakh River.

Orderly piles of mammoth bones line the approach to scientists' tents in a camp on the Berelyakh.

Among the bones recovered was this skull of a young mammoth. Most were females or half-grown males.

Mammoth death traps

Sketches by Nikolai Vereshchagin show seven ways mammoths may have died: here, by falling in ice shaft.

viving tusk to exchange it for goods with a Cossack merchant who started the news (for which big rewards were paid) on its way to the Academy of Sciences in St. Petersburg. Because of the immense distances involved and lack of communications, an expedition did not reach the site until more than a year later. They built a blockhouse containing two stoves over the body to thaw it out of the surrounding earth and were compelled to dismember it for the long journey by pony sledge convoy, the only means of transport, to the Trans-Siberian Railroad. "At every large station on the way," wrote one of the scientists, "people crowded to see the mammoth, and went away disconsolately when we pointed out to them that the wagon was sealed."

Eight days after its arrival in what was then St. Petersburg, Nicholas II, the czarina and a large retinue visited the mammoth which had been reassembled in the zoological museum in its original posture, reeking, however, with a "repulsive ammoniacal stench" in the steam-heated building. Was there not, asked the czarina with a handkerchief to her nose, anything else interesting in the museum as far away as possible?

This Berezovka mammoth had died 45,000 years ago, probably by walking along a cliff edge when it collapsed. With one front leg doubled up and the other stretched forward, it must have struggled to rise. But it had broken several bones in its fall and was quickly killed by collapsing earth, so quickly indeed that half-chewed food—leaves and grasses—was found in its mouth and on its teeth.

Professor Vereshchagin must be constantly aware of its presence, for his office is only up the stairs of the connecting Zoological Institute and down a short corridor. It is a small room overlooking a quiet courtyard, its walls festooned with maps and photographs

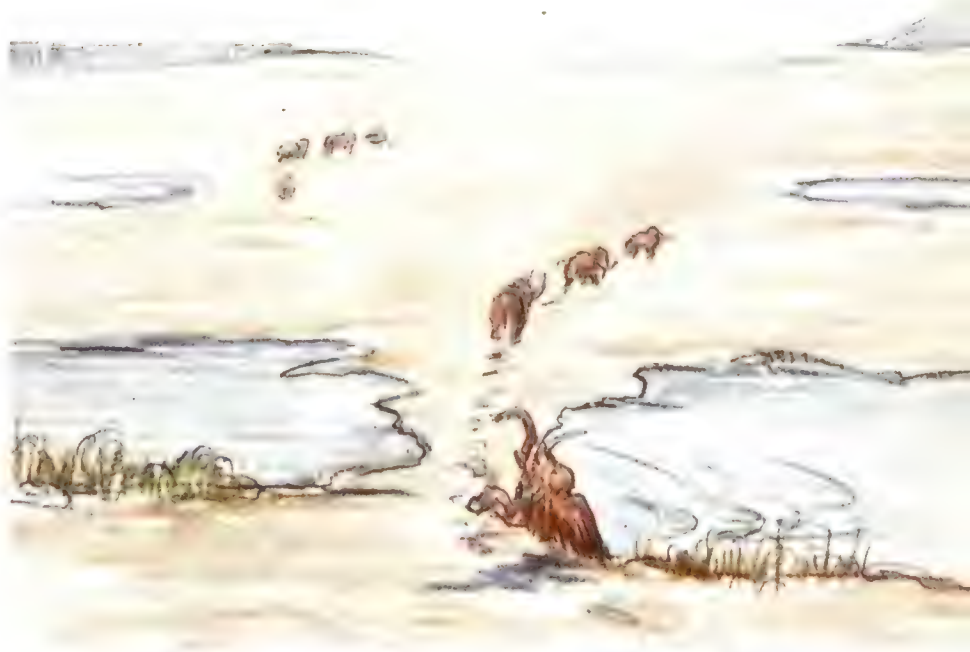
Several Siberian geologists believe the Berezovka mammoth died when a cliff edge collapsed under it.

Some of the preserved mammoths may have died from starvation after a rise in sea level isolated them.

Some mammoths may have been trapped when a river changed course, such as those caught on islands.

Vereshchagin's own theory is that many of the deep-frozen mammoths simply fell through thin ice.

Landslides probably trapped their share. Instant burial would have preserved them from scavengers.



Eroded shores of lakes could have collapsed under the animals' weight, plunging them to their deaths.

This log cabin was built over the Berezovka mammoth to thaw the ground and make possible its removal.

A column of pony-drawn sledges transports remains of mammoth, dismembered for St. Petersburg trip.

of mammoth sites, its cupboards full of more photographs and mammoth treasures: 12,000-year-old mammoth hair, for instance, which feels like thin wire, and on the floor—one must be careful moving about—several mammoth tusks.

Through the 1950s and 1960s Vereshchagin studied the remains of this prehistoric form of elephant all over the Soviet Union: the Caucasus and Crimea, the caves of the Urals; the mountains of the Soviet Far East, the valleys of the great Russian rivers. For the mammoth was by no means confined to Siberia. With its shaggy, long coarse hair growing through a woollike coat next to the skin and with its remarkable incurving tusks, sometimes ten feet long, this ancient herbivore roamed northern America between present-day North Carolina and Alaska, over the Bering Straits land bridge and throughout most of Russia and Europe, crossing the connecting land mass into Britain and Ireland. Its bones—which late Palaeolithic Man used for his dwellings in what is now the Ukraine—have been found in many parts of Europe, often explained as those of giants or saints.

But it is only in the permafrost soil of Siberia and the northern strip of North America that the fauna (and flora) of the Pleistocene era are preserved, and only in the dry Arctic conditions that bones, teeth and tusks can survive in the open for many centuries.

In 1956 Vereshchagin first heard of a great mammoth "cemetery" on the river Berelyakh, a tributary of the Indigirka where, in his words, "landslides on the bluff above the river had piled up a chaotic conglomeration of mammoth bones and tusks."

Not until the summer of 1970 did he reach it, in a seven-man expedition converging from Leningrad, Magadan and Yakutsk, headed by Dr. Boris Rusanov, a geologist from the Yakut Academy of Sciences. Lifted into the last stretch with their tents, equipment and provisions by helicopters, they landed by the side of this remote Arctic river flowing beneath a sun that never set.

They found an extraordinary sight: thousands of gray bones lying on, or protruding from, the river-bank's alluvial deposit for more than 200 yards and so densely packed that they were protecting the bank from erosion. No such mammoth boneyard had ever been found before.

With nets over heads and shoulders against the encircling clouds of mosquitoes, Vereshchagin and his assistant counted some 3,500 bones, some of them notched or scratched, presumably with the implements of prehistoric hunters.

To excavate the area, they used a fire-engine pump to hose away the frozen ground with powerful jets of water which, on reaching buried tusks, ribs or short bones, threw up fountains of clods. Many smaller features were destroyed under the impact but there was little alternative. Beneath 6 to 12 feet of loam they found a layer of tightly packed bones three to four and a half-feet thick, stretching the full 200 yards of the surface bones: another 3,500 of them, the whole mass interwoven with veins, wedges and lenses of fossil ice.

Almost all were of mammoths, but there were very occasionally the bones of other Pleistocene animals:

At excavation site in southern Siberia, bones of millennia-old mammoths are marked out for study.

Arctic hare, wolf and wolverine (including one whole wolverine skeleton with skin and hair still attached to its head and paws), horse, bison, reindeer, woolly rhinoceros and cave lion (the still mysterious big cat of the Pleistocene era). Nearly a quarter had been gnawed by predators but the best-preserved still retained a waxy marrow.

Sometimes they found, entwined in the chaos of bones and skulls, faded brown strands of wiry mammoth hair and yellow-gray tufts of wool still attached to bits of skin, and once the hind leg (now on show in a Yakutsk museum) of a large mammoth, its muscle structure intact beneath the skin and wool.

A piece of skin now in Leningrad shows long hair that grows out from the wool of this Ice-Age mammal.

What had caused this extraordinary accumulation? Vereshchagin came to believe that it had not been a mass mortality but an accumulation of several small herds of mammoths which had probably perished up-river year after year either in winter blizzards or when crossing thin ice in spring or autumn. Borne down the stream during the thaws, he suggests, they may have foundered at this point and decayed, their bones sinking into the riverbed. Only such a secondary burial (the remains moved by natural causes from one place to another) could explain the chaos of bones as well as the absence of complete skeletons.

The next summer, Vereshchagin was back at the site when he heard that a Yakut hunter had found mammoth remains about 250 miles away on another tributary of the Indigirka, the Terektyakh. The skeleton retained bits of muscle, ligament and skin, some of it wrapped round the head by the current. The 50,000-year-old remains "smelt like old rubbish," Vereshchagin has written, "but all the same our dogs tried to get at them." Here the surrounding frozen soil contained not only beetle wing cases and the excrement of lemming and pike, but many remains of vegetation which show the flora of the area to have changed very little over 50 millennia.

The following year, 1972, Vereshchagin, exploring the mainland coast south of the Novosibirsk Islands, found projecting from the low sea cliff seven tusks 11-and-a-half-feet long and each weighing more than 100 pounds, bigger than any at Berelyakh.

At the same time Boris Rusanov, the leader of the Berelyakh expedition, and his colleague Pyotr

Lazarev, Vereshchagin's Yakut postgraduate student, heard that a mammoth skeleton had been found on the banks of the Shandrin. When hosed out, it proved complete except for its tusks, which had been cut off by some hunter. It was a female with her back molars missing, a sign of old age, the probable cause of death. She was found in the position of a dying elephant, lying on the belly with the legs stretched out in front. Although this time no wool, ligament or muscle remained, what excited Rusanov and Lazarev was that her internal organs had been protected, primarily by the rib cage, and were tolerably intact, although semidecomposed: a solid frozen block weighing 550 pounds comprising stomach, intestine and other organs.

On the surface of that 550-pound block, Rusanov made a discovery, finding there 12 larvae of a warble fly of the genus *Cobboldia*, the larvae of which genus are found unchanged in the stomachs of elephants today.

The organs were first taken to Yakutsk and placed in the large natural refrigeration chamber hollowed out of the frozen ground beneath the Permafrost Institute, and then flown together with the skeleton to the Biological Institute at Akademgorodok, the science center in southwest Siberia, there to be studied by all manner of scientists. Seeds and grasses from the intestines indicate that the mammoth died in autumn. Indeed, only mammoths dying in autumn or winter were likely to be frozen and preserved, for those dying in summer would decompose or be eaten.

Such finds, particularly, of course, that of the baby mammoth, can throw much light on the still little-understood world of this long-extinct mammal, explaining for a start the causes of burial such as landslides following the thaw of ground ice, entombment in the silt of a sudden flood or the interment of a dead animal on Siberia's northeast coastal plain in wind-swept drifts of loess, fine dust deposited here in an ice age.

With the first winter the body freezes and only the top layer of ground above it thaws thereafter. Then, tens of thousands of years later, it can come to the surface, perhaps by Man's excavation as in the case of the baby mammoth, perhaps by erosion or landslides. This was what happened at Berezovka. One day, perhaps, a perfectly preserved human being several millennia old may appear; there is no basic reason why not.

The Berelyakh mammoth burial ground was situated on a *yedoma,* one of the 30- to-50-foot rounded hills on Siberia's northeastern plain. These hills, consisting almost entirely of honeycombs of ice around thick columns of frozen loess, are relics of the Pleistocene plain which has been eroded from that original hilltop level by innumerable lakes perpetually forming and draining away.

At the Berelyakh site the present river, having changed its course over the millennia, has cut its way through the hills releasing the bones found littering the bank. Other bones are still buried in the bed of a previous river course, now about 25 feet above the present river.

Through such causes almost 50,000 mammoth tusks are said to have been found in Siberia between 1660 and 1915, serving an extensive mammoth ivory trade. But this is nothing compared to those still buried, according to Vereshchagin, who calculates that the heavy erosion of the Arctic coast spills thousands of tusks and tens of thousands of buried bones each year into the sea and that along the 600-mile coastal shallows between the Yana and Kolyma lie more than half a million tons of mammoth tusks with another 150,000 tons in the bottom of the lakes of the coastal plain.

But why did the mammoth become extinct along with the cave lion and woolly rhinoceros at the end of the last Ice Age 10,000 to 12,000 years ago? Precisely because of the new warmth which changed the climate and vegetation. The cold but lush grassy steppe, producing abundant pasture for tens of thousands of large herbivores, turned into a boggy tundra of moss and sedge full of lakes and under snow in winter, where they could no longer exist.

But as more of their remains are found, some almost perfectly preserved in the frozen earth for so many millennia, the mammoths will live more clearly in our minds, grazing the grasses of a pristine planet. They are a tangible link to a world we never knew.

Complete skeleton at a Kazakhstan museum reminds viewer of what mighty beasts once roamed the Earth.

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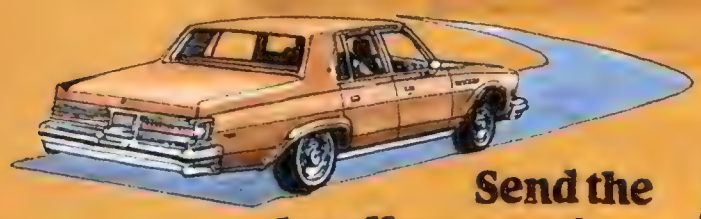

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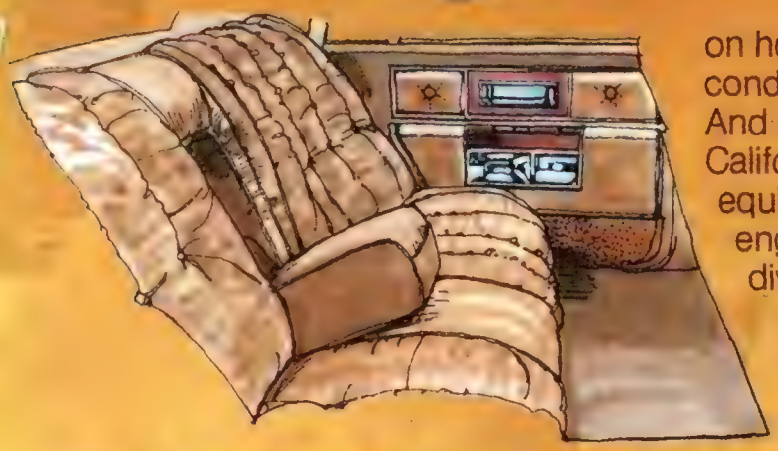

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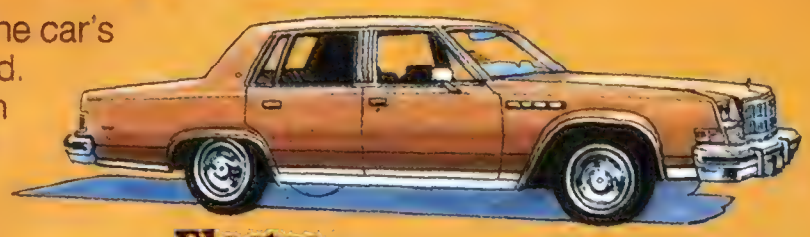

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A little science. A little magic.

White birches, clumped often in groups, lend enchantment to water on an autumn day.

By Charlton Ogburn

Birch trees are the Graces of our wild forests

Man finds strange comfort in their serene beauty, and scores of uses for them from canoes and caps to veneer and beer

A few years ago a motion picture came out in the USSR without the Marxist-Leninist slant to which Soviet audiences are accustomed. Picking up its central character, Yegor Prokudin, a professional thief, as he returns to his native town seeking a new life and surcease from the perplexity and bitterness in his heart, *Kalina Krasnaya* tells an honest human story. Yegor is granted an intimation of the serenity he seeks and a promise of an unburdening of the spirit. He finds them in the birch trees of his country's eternal forest. He embraces their white trunks and addresses them as if they had human understanding.

More than a few persons could put themselves in Yegor's place. In times of inner discord, one can find comfort in the patience and poise of trees, in their radiating forms that lift the vision out of oneself and disperse it skyward. It is not hard to imagine them as sentient beings. And this, to me, is especially true of that group of trees botanists call by the name the Romans gave them: *Betula*. If I am ever discovered embracing a tree, it is likely to be a birch.

Birches belong to a family including the alder, hazel, hornbeam and hop hornbeam. Many members are only shrubs, and birches, comprising the largest of them, are usually of modest size. "Ovate" is the botanists' term for their leaves: pointed at the end, rounded at the base and toothed. What distinguishes the family are the catkins (because they resemble kittens' tails) in which the tiny flowers are borne.

Birches, for me, are set apart from other members of

the family, and among trees in general, by their bark—and, I might add, by their lively foliage and lovely, attenuated forms. Smooth, silken birch bark is like skin. It has pores, horizontal slits called lenticels to permit "breathing" through an otherwise airtight integument. And like skin, it comes in white, yellow, red and black. Birch bark is beautiful and it covers some of our most beautiful wood; but many men have blessed it for its utilitarian qualities.

The genus *Betula,* numbering some 60 species, is essentially northern; in the vicinity of Norway's North Cape, birches form a forest within 1,400 miles of the Pole. Birch lands take in most of Europe and the upper quarter or third of the United States, projecting southward where mountains provide the cool air and moisture the tribe relishes. But thanks to two species that follow rivers southward, one to the Gulf, the other into the high canyons of the Southwest, birches are indigenous to all 49 continental states.

Slim of trunk and of limbs and twigs—even the winter leaf buds are long and narrow—birches are correspondingly supple. Inevitably you think of them as feminine. I am sure I did in my youth, when I became enamored of them. They meant to me especially sylvan cool and purity—the forest sanctuaries of the high Appalachians after the heat of Southern lowlands, the pastoral hills and woodlands of rural New York after the turmoil of Manhattan. Most, especially on the overgrown pastures of Westchester County, were of the kind probably best known to Americans—little white birches. (Called by some botanists gray birches, these are not gray when mature but chalk white with black triangles at the base of the branches.)

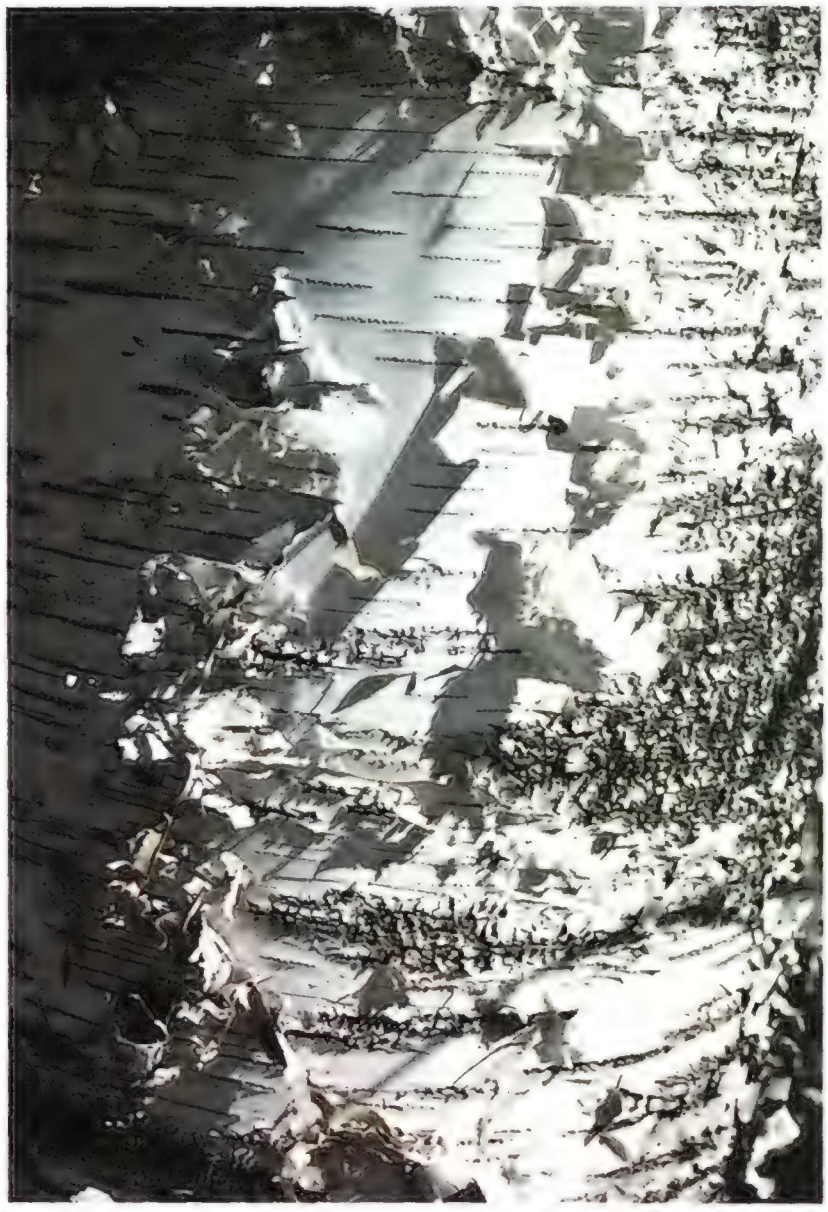
Famous as a nature writer, Charlton Ogburn was an early SMITHSONIAN *contributor. His latest article, in September 1976, dealt with birds.*

Little whites grow characteristically in clumps of several trunks on sunny slopes, in an arborescent representation of the Graces—three or more. It was these, when they slanted more than normally, that led Robert Frost to think of the lonely farm boys who had ridden them. He tells us that he had once been such a boy; and now, when he is "weary of considerations, and life is too much like a pathless wood" (as it was to Yegor Prokudin) and he would "like to get away from earth awhile":

I'd like to go by climbing a birch tree,
And climb black branches up a snow-white trunk
Toward *heaven, till the tree could bear no more,*
But dipped its top and set me down again.
That would be good both going and coming back.
*One could do worse than be a swinger of birches.**

To that I can testify, as I can to the delicacy of a birch's crown, in which the lightest stir of air sets the foliage trembling. Have any of our trees leaves of a brighter green than the birches? I doubt it. And in autumn, as Hugh Johnson says in his wonderful *Inter-*

Bark of the white or canoe birch peels
in lateral strips on mature tree such as this.



*From "Birches," from *The Poetry of Robert Frost* edited by Edward Connery Lathem. Copyright 1916, © 1969 by Holt, Rinehart and Winston. Copyright 1944 by Robert Frost. Reprinted by permission of Holt, Rinehart and Winston, Publishers.

national Book of Trees, "Birch leaves turn the purest, most sovereign gold of any tree's." Beautiful in themselves at that season, the big white—or canoe or paper—birches bring out the beauty of other trees. As I have known them in October in the Berkshires, the lissome marble columns rising amid the living torches of red and sugar maples, each intensifying the radiance of the other, offer a spectacle surely unsurpassed.

In winter the supernal whiteness of those trunks is perhaps even more striking because mysterious. In early dusk, against the background of the somber spruces of the boreal forest they seem to glow as if with an interior light. *Science News Letter* speaks feelingly of how "this eerie, radiant whiteness" stands out as "the dark sky of winter overhangs the drab hills and forests of a chill world." It explains that the effect "is caused by a reflecting and scattering of light in all directions from the many microscopic air spaces in the outer layers of bark"—the "same phenomenon that makes snow white."

Through winter, birches of all kinds keep the promise of spring alive. The male catkins develop before summer's end and stand through the cold months like little outstretched fingers. In April or May, when their shorter, upright female counterparts appear, they greatly increase in length and hang laden with rich yellow pollen, bending the slender branchlets beneath their weight. Against a blue sky the golden cords must stir the most obdurate heart. A white birch tasseled in gold is like a decoration conferred on the Earth.

Catkins of yellow birch develop in spring. Male are at right; female emerge at left.

Bark of the yellow birch shows long lenticels. This is a relatively young tree.

To North Americans, birches have perhaps first of all meant birch-bark canoes. If any primitive culture, lacking metals, has ever produced another implement at once so far-reaching in practical effect and so great a delight to the eye, it does not come to mind.

"There is plenty [of birch] in divers parts of the Country," an early visitor wrote. "Of the barck of these the Salvages of the Northerne parts make them delicate Canowes, so light, that two men will transport one of them over Land whether they list, and one of them will transporte tenne or twelve Salvages by water at a time."

Adapted for the fur trade by the French, some canoes stretched 35 or even 40 feet in length and, with as many as 14 voyageurs bending to the paddles, were used to carry four tons or so of cargo nearly a thousand miles from Montreal to Grand Portage on Lake Superior. To form a skin for such craft, bark had to have very special properties. That of the white birch has. Laminated—I can count 31 layers in a piece one-eighth of an inch thick I have before me now—it is tough yet pliant, especially when boiled. The resin it

contains, called betulin, renders it impervious to water and resistant to age and decay. To the Indians of the North, it meant not only canoes but buckets and cups and covers for tepees when skins were lacking.

Its Old World counterpart still provides our northern European contemporaries with roofing tiles, and in Scandinavia sheets of it are placed across rafters before sod is laid on against the cold. Lapps used it for cloaks and leggings, while 70 years ago in Russia millions of peasants were wearing birch-bark shoes. As for Britain, the old ballad of *The Wife of Usher's Well* tells us that "The carline wife's three sons came hame,/And their hats were o' the birk."

In other ways the birch has helped our species come through winter. Flour can be made of the inner bark. Mixed with the fat of sea wolves, it is said to have been a staple in eastern Siberia in time of famine. Ruth Rasey, a Vermonter from way back, tells how her great-grandfather, who called the birches of his Green Mountain farm "our great white benefactors," had quantities of the bark milled to augment a meager grain supply for his sheep and cattle in 1816, the famous year-without-a-summer. Back then, too, she relates, the delicately wintergreen-flavored inner bark was chewed to soothe cankers, while, ground and boiled, it yielded a juice healing to cuts and burns.

The air held between the cells gives the white birch's bark a snowy effulgence and provides insulation. The corky envelope protects the green film of the cambium layer underlying a tree's inner bark, by which the tree grows. Birches are probably the hardiest of trees. In the extreme northern parts of their range and high up on mountains, they occur as shrubs, incidentally providing welcome browse for caribou. However, in the great boreal forest of the Northern Hemisphere, white birches are among the tallest deciduous trees.

The American Forestry Association's *Social Register of Big Trees* gives the championship among American white birches to one near Decoster, Maine: 18 feet, one inch in girth of trunk—about six feet in diameter—and 96 feet tall. Some in Russia are said to reach 130 feet.

The resilience that makes birches good for swinging also serves them well in winter. (It has not, by the way, always endeared them to boys. In the past, when schools were places of discipline, "the birch" was synonymous with corporal punishment.) In ice storms, which break the limbs of unyielding oaks, birches bend beneath the encrusting weight. Then, as Frost says, "the sun's warmth makes them shed crystal shells/Shattering and avalanching on the snow crust" as if "the inner dome of heaven had fallen."

Bark of the black birch is really a spicy brown. Heartwood is dark and ages like mahogany.

Not only winter hardiness fits birches for success. The conelike fruiting bodies into which the female catkins develop disintegrate into light, veined seeds designed to ride the winds. The little white birch is quick to colonize abandoned farms in the Northeast. Across the northern states and Canada, following the lumberjack, the larger white birch is said to occupy more territory than before the white man came.

If no other tree is as white as the white birch, none in our woods comes closer to ebony than the black or cherry birch with its dark, red-brown bark. I can remember from boyhood the feel of the cool, satiny skin against my cheek. It is quite true, as Donald Culross Peattie writes of it, that "to place one's hand upon the exquisitely smooth bark, to smell the delicious aroma of the twigs, is to make acquaintance —or renew an old love—with a dryad."

Those who know its sap have given it another name: sweet birch. In times past, when most of us were country dwellers, black birches were tapped like maples. The sap was fermented with grain and widely relished as birch beer. The sap of white birches, equally rich in sugar, has also been collected and fermented into wine, on both sides of the ocean. Unfermented "birch water" has been thought in the Old

Gray or little white birches stand out like bleached bones in a dark winter forest.

World to promote beauty and strength—not surprising in view of its origin.

The American Indians used birch trees widely for medicinal purposes—for example, the root of the paper birch as a seasoning to disguise the bad tastes of herbal cures, and birch sap cooked with maple sugar to make a syrup for stomach cramps. Ruth Rasey says they cooked meat in the sap, having found that when boiled, the sap became syrup which hardened as it cooled and could be kept indefinitely.

The black birch's aroma, of which Peattie spoke, is that of wintergreen, and wintergreen is the flavor of the twigs. Many were those I chewed in my early years, for I had found how refreshing the essence is to a thirsty hiker. What I had no way of knowing was that during those years it was saving the life, or so we believe, of the girl I was to marry. She was a victim of sclerodermas, a mysterious hardening of the skin—in her case on the leg—which if it continues to spread is fatal. The rather old-fashioned physician to whom her parents took her, when two specialists had given up, had the idea that the continual rubbing with oil of wintergreen might work a cure. Whether it did cannot be proved; but it was followed by her recovery. Great numbers of young black birches used to be cut and milled for the valuable oil. Now the wasteful process has been supplanted by synthesis.

The black birch's range has the Appalachians as its core though it spreads across the northeastern states up to central Maine. An addict of the Appalachians, I like to think that it was on their cool heights that the black birch and its relative, the yellow, came into being during the 60 million years of the Tertiary, when North America was generally warmer than now.

Of the two, the yellow, or platinum as it might well be called, is the hardier and larger. (The champion for height, a yellow in Mackinac County, Michigan, is

Big white birches set off flaming maples at Isle Royale National Park, Michigan.

Their bark sheathed the canoes of Indians and French voyageurs who plied these waters.

the tallest birch measured in the United States: 114 feet.) In the Appalachians no hardwood climbs higher except in their northern part, where the big white birch clings to gale-lashed slopes, flattened to a mat. At home from Minnesota and Iowa eastward to the coast between Delaware and Newfoundland, the yellow birch is the predominant tree of the high deciduous forest from New Hampshire's White Mountains to the Blue Ridge of northern Georgia.

On the hundreds of miles of trails I have walked in the southern Appalachians no deciduous tree has impressed me more. Its trunk stands straight and glistening in the forest like—well, if I let myself go I should say an Excalibur. The bark is, I cannot deny, rather a dull yellow-tinted silver (p. 75).

And what a will to live! You find yellow birches growing from the tops of boulders, embracing them in their platinum-barked roots like pythons. Such trees are to be accounted for by seeds that alighted on the boulders and sent roots down the moist fissures or beneath the moss into which they will have been blown or washed. Several years may be required for the roots to reach the ground, but the infant birches have the capacity, if given half a chance, of holding out till they do. Often, too, you see big yellow birches standing on legs two feet high or more. These developed from seedlings that grew on logs which have completely rotted away.

In old age, which finds them looking like great oaks or maples with massive, rough trunks, yellow birches are equally tenacious of life. One I saw at 5,000 feet on Virginia's highest mountain had a trunk the breadth of a hogshead and, broken off 25 feet up by a gale or lightning bolt, was mostly consumed by decay. Yet the tree was making a fresh start, developing a new trunk from a limb at the top, which was raised like an arm in burnished mail.

Freakish grain produces curly birch

Rotted wood of yellow birch, dried, was the punk from which Indians in its range started fires. And, just as many lives have been entrusted in boiling rapids to the skin of the big white birch, so have many on the high seas to the wood of the yellow—a favorite of Maine and Nova Scotia shipbuilders. From the wood of the white have come other indispensables—paddles and the frames of sledges and snowshoes.

In Europe, appreciation of birchwood goes back to prehistory, as we can learn from the *Kalevala*. One of the heroes of this Finnish national epic, needing a harp, "carved . . . the body from tough birch, the frame from curly birch." When, having been strung with tresses yielded by a "charming maiden," the "birchwood spoke out, the leafy sapling resounded,"

and the music was so joyous that "whatever men were nearby, they all stood cap in hand . . . daughters with tears in their eyes" and "there was not indeed a wild animal that did not come to listen. . . ."

Curly birch is a freak formation of the grain, like bird's-eye maple. A convoluted grain also occurs in the burrs that develop on birches, and from these many articles are turned in Scandinavia, among them tankards which, hooped in silver, are handed down from generation to generation.

Hard and strong, birchwood has served in countless yeoman roles. America once rolled on wheel hubs of yellow birch, as Europe once in carriages of its white; both woods are exceptionally tenacious of grip. But birch is given its due only when used in fine furniture, cabinetry and paneling. Yellow birch's light brown, reddish heartwood surrounded by nearly white sapwood has a native satiny sheen under a finish. With pale yellow sapwood, the heavier black birch has a darker heartwood that becomes richer in tone with age and exposure to light.

Where you leave the realm of the yellow, going south, you enter that of the river, or red, birch. This is the one genuine southerner of the genus and one of its few water-loving members. The division of the trunk at 10 to 15 feet into steeply ascending, arching limbs is characteristic, the pinkish-to-cinnamon bark, peeling in papery curls, unique. "A beautiful tree," exclaimed Charles Sprague Sargent, who helped make Harvard University's Arnold Arboretum admired the world over. "To its presence upon their banks, dipping the ends of its slender flexible branches into placid or bounding waters, the charm of many southern rivers is often largely due." It matures its seeds in time for them to fall on the fertile soil of stream banks when they are exposed in early summer and send up treelets several inches high before the waters rise again.

A small tree of glossy, bronzy-brown bark discovered by Lewis and Clark, the western birch thrives on mountains high above the Southwestern desert and on sagebrush plains to the north so long as there is cool, running water for its refreshment; water birch is a common name for it. As Sargent says, it "enlivens sombre cañons and elevated valleys with its masses of graceful feathery stems, its beautiful lustrous bark and the cheerful green of its foliage. . . ."

White birches can be, and are, grown well to the south of their homelands. Here, however, especially in times of drought, they are susceptible to the bronze birch borer. The larvae of this tiny beetle tunnel through the cambium layer and by girdling the victim can kill it. Spraying will control the borer as well as the leaf miner that attacks birches. However, one must hope that the program being carried on at the National Arboretum, under Frank S. Santamour jr., to develop borer-resistant white birches by selective breeding and hybridization will succeed, as Dr. Santamour is confident it will. Against one birch-girdler, however, science is helpless. That is the human who cuts a roll of bark, leaving the tree permanently disfigured or injured, perhaps fatally.

With the delicacy of their slim trunks and airy foliage, white birches give a cool elegance to the most modest yard and sumptuous mansion grounds. The European white birch is especially favored on both sides of the ocean for its jagged leaves and graceful, drooping habit of growth, which in some forms is almost that of the weeping willow. If you see one of these bridal trees leaning over a pool with wands dipping toward their reflections you will find it easier to believe, with Slavonic peoples, that the spirits of drowned maidens—Rusalki—climb up them from the water in early summer to pass the time until cold weather, bewitching "passers-by with their beauty and their sweet voices," as the *Larousse Encyclopedia of Mythology* has it.

Our big white birch may be somewhat more rugged in style of growth, but its bark is even whiter than the European's and has a warmer glow. The world is richer in having both.

I do not know whether the unknown author of *The Wife of Usher's Well* had any special knowledge when he wrote:

. . . at the gates o' Paradise
That birk grew fair eneugh.

But if a tree does grow at those gates, I should not be surprised if it is a birch.

Ice storms flatten many trees, but resilient birches (at left of picture) wear the crystals like jewels.

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UR CAR AS HIGHLY
R RATES HIS?

If you put your car to the test on the left and discover it rates a lot of "fairs" and "poors," you should give some thought to owning a Volvo.

Recently, Volvo owners were sent a similar questionaire as part of a nationwide survey among new car owners. They were asked to rate their new Volvos on these, and several other points.

The results were very enlightening.

For example, when it came to quality of workmanship (something many people have stopped trying to find in a car) 86.9% of the Volvo owners rated their cars "excellent" or "very good."

Ride in a Volvo and you'll understand why. There's a definite feeling that this car has been fit together instead of slapped together. A strong, unitized body construction helps eliminate squeaks and rattles. And if you're old enough to remember when a paint job was actually a feature you could point to in a new car, you'll admire Volvo's. It's five coats deep.

Volvos also received high ratings for what their owners could fit into them. Namely, themselves.

Inside, Volvo has enough leg, hip, shoulder and headroom for five six-footers. Up front, they'll be sitting in Volvo's famous orthopedically-designed bucket seats. Which adjust in ten different directions, including from "soft" to "firm" against the small of your back. In the back of a Volvo, you'll find a trunk with room inside for, believe it or not, a trunk.

These are just a few of the reasons why Volvo owners gave higher ratings to their cars' comfort and roominess than Cadillac owners gave to Cadillacs.

Volvo owners also like the way their cars handle. Volvos have rack and pinion steering. Which, together with an advanced spring-strut suspension makes for a smooth, stable, controlled ride. Volvo also has power-assisted disc brakes on four wheels instead of just two, for quick, straight-line stopping.

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*Survey conducted among owners of new cars bought in May, 1977. †Suggested retail price P.O.E. local taxes, dealer preparation, delivery charges and Lambda Sond'"units additional.

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VOLVO. A CAR YOU CAN BELIEVE IN.

By Taylor and Edie Belcher

Great golden art of the ancient Peruvian artisans

A rich display covering some 2,000 years of pre-Hispanic objects starts tour at New York's Museum of Natural History

"We offer this artistic selection, preserved in spite of ignorance, and lust for wealth, clandestine and empirical desecration of tombs, lack of artistic sensibility and secret smuggling abroad. . . . We present this work, then, to introduce the newcomer to a magnificent past, to convince him that the beauty of pre-Columbian gold work was not a myth."

Thus Miguel Mujica Gallo has described his dazzling collection of pre-Hispanic gold from Peru, a selection of which is now being shown at the Museum of Natural History in New York through January 1, 1978. The show will travel in the coming year to the Field Museum of Natural History, Chicago; the California Academy of Sciences, San Francisco; and the Detroit Institute of Arts. The exhibit covers a period of nearly 2,000 years and deals mostly with the pre-Inca cultures of Moche and Chimór and to a lesser degree that of Vicús, Nazca and Paracas, culminating with the Incas.

Chimú "golden gloves," in fact ceremonial arms and hands, each finger capped with an elegant

When we think of Peru before the Spaniards, the tendency is to fix on the Incas to the virtual exclusion of their predecessors. Yet the Incas were very much like the Romans, building upon the creations of others and adapting and improving upon their accomplishments. The Inca empire was to last a mere century, compared to the more than 2,000 preceding years in which the Chavín, Paracas, Vicús, Nazca, Moche and Chimú cultures flourished. The Incas' metallurgy was a typical instance. Their goldwork, largely melted down by the Spanish conquerors, represented an adaptation of the techniques of the Chimú goldsmiths whom they had brought to their capital at Cuzco.

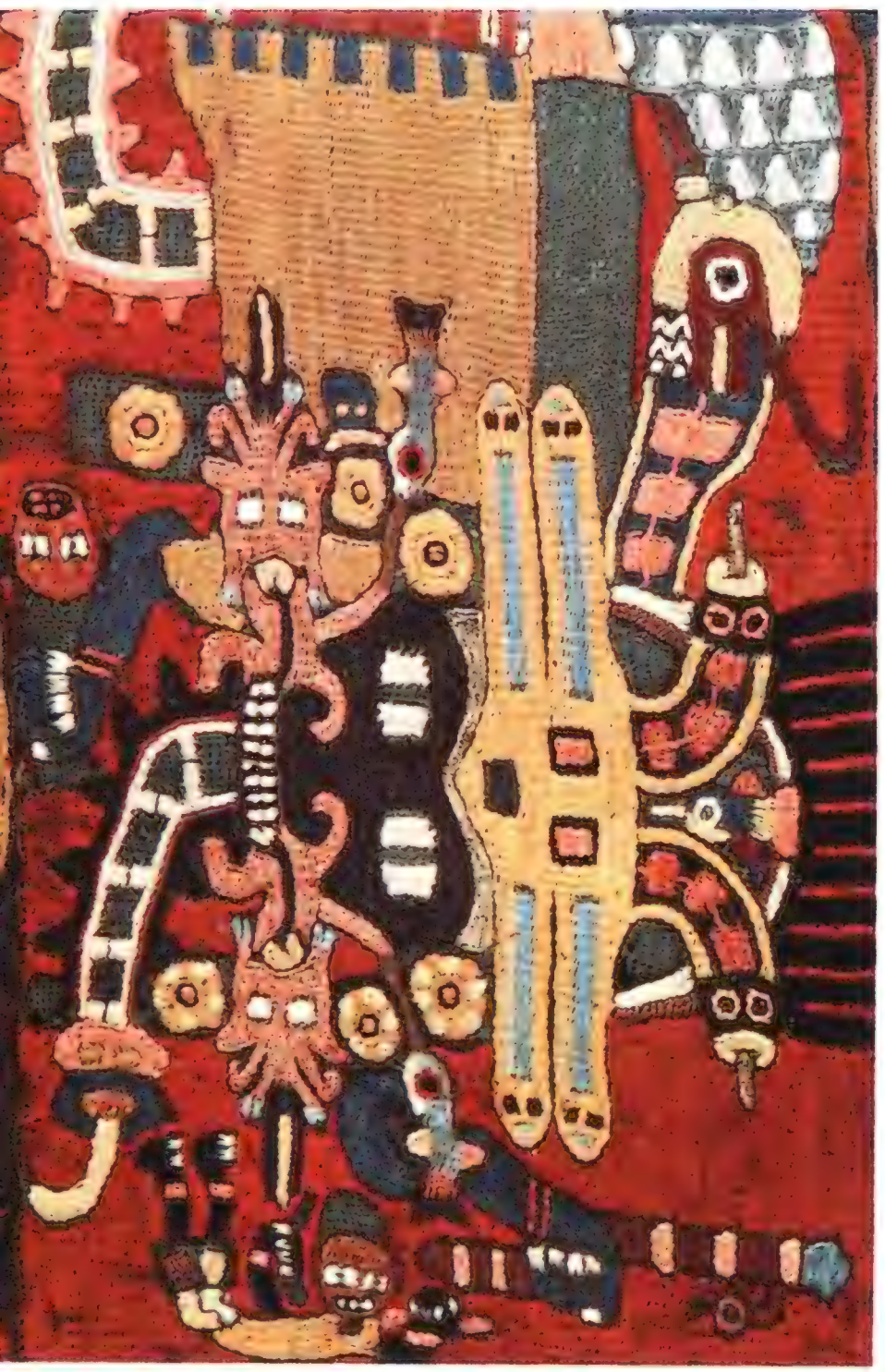
The splendid Paracas funerary mantles shown in the exhibition serve only to whet one's appetite to know more of this unique aspect of early Peruvian art and archaeology. This culture (circa 500 B.C. -A.D. 200) developed in the southern coastal area and represented the high-water mark of pre-Hispanic embroidery. As in the earlier Chavín culture, the stylized feline animal played an important part in the decoration of their

silver fingernail, indicate both imagination and riches of Peruvian culture. At left, golden headdress.

pottery as well as their textiles. While the pottery did not use elaborate or colorful ornamentation, the textiles did. Usually on dark backgrounds, we see the imaginary bestiary of the Paracas embroiderers: stylized and hybrid birds, beasts and fish, snakes and men. Some interpret them as fertility or magic symbols, moving up and down the fabrics in rows as though floating in space. A single mantle may have hundreds of such figures.

Utilizing cotton and alpaca wool, the Paracas artisans employed various fabric techniques known today, in addition to some which are impractical for mechanical looms. Their art of embroidering borders with miniature three-dimensional figures was near-miraculous in its execution, incorporating some 190 different shades of colors. Their brilliant though subtle color schemes have been preserved for us in their graves only by the eternally arid climate of coastal Peru.

The oldest objects in the exhibition are from the recently identified Vicús culture (circa 220 B.C.-A.D. 300). Like the Nazcas, their elegantly simply gold-



Detail of Paracas funerary mantle, one of textile wonders of the world— a work of stupefying detail.

work was primarily in the form of sheet gold figures. Their nose ornaments employ both silver and gold in symmetrical designs, their earspools are very early examples of gold ornaments which were a feature of all the later cultures including the Inca. The Spanish conquerors were struck by these personal adornments worn by the Emperor and his court and other officials of the empire. The insertion of these large gold spools in the earlobes gave the name *orejones* (big-eared ones) to Inca aristocracy.

While the exhibition does not emphasize Nazca objects, there are a few examples of this extraordinary culture (circa A.D. 200-500). Their goldwork is primarily of cut metal sheets, with objects in the form of fanciful birds and animals.

Nazca pottery is the easiest of all Peruvian ceramics to identify. Rather more utilitarian in form than the anthropomorphic Moche pots, they are highly decorated with animals, demons and geometric forms in as many as 11 colors.

It is the masterpieces of the Moche and later Chimú goldsmiths that form the core of the Mujica collection. The marvels they created give credence to the accomplishments of these pre-Inca cultures.

In the region of the Moche River in northern Peru, what we commonly call the Moche culture flourished from about the 2nd century to the 8th century A.D. The Moche kings developed a highly integrated, warlike state which lasted almost 500 years. Linked together by an extensive road system and communications service, the irrigated coastal river valleys provided the economic base necessary to support the sophisticated and varied art forms for which the Moche are famous.

Their realistic ceramic art has left us a detailed history of their people and customs. It has been said that the ceramics are a mirror of their life, while the goldwork was a part of their religion. Their passionate desire for realism covered all phases of their life-style, "a vivid evocation of their world and of the heaven they imagined," as one writer observed. Here is a sensuous, even libidinous record of their sexual customs. We see beauty side by side with faces deformed by disease or passion, reflecting arrogance or fury, defeat or the weariness of labor. The Moche potters painted landscapes with unusual attention to detail—the rough irregular contours of the hills, abstract curving lines depicting the waves of the sea, or a glaring sun pouring heat upon the desolate shore.

The portrait ceramics were especially graphic, showing the round face, high cheekbones and hooked nose with wide-flaring nostrils of the Moche Indian.

Taylor and Edie Belcher lived in Peru for five years during his residency as the American Ambassador.

Colors were strong and varied. The movement of figures, whether a man running, a fish swimming or a bird flying, have an extraordinary vividness and life-like quality. Later cultures never achieved this.

The superb Moche goldwork emphasized mosaics of turquoise encrusted on gold, exquisite necklaces of beauty and imagination. Perhaps the most striking of all the necklaces is made of graduated hollow gold balls, the largest two inches in diameter, and the whole more than three feet in circumference, ending with a typical Moche ornamented tweezer pendant.

Their craftsmen mastered the technique of smelting and alloying silver and copper with gold, with subsequent surface enrichment achieved through leaching the copper or silver with acid, leaving a layer of pure gold. They knew the lost-wax method of casting and they used their own forms of welding, soldering, hammering, gilding and *repoussé* in producing these shimmering treasures.

The powerful cult of the dead made great demands on the artisans, and the profusion of these beautiful items was a result of the continuing need to supply both practical and luxurious objects for accompanying the body to the tomb.

The Imperial epoch of pre-Columbian art introduced still another great kingdom, Chimór. By the mid-12th century the Chimús had revived, in a political and geographical sense, the classic Moche kingdom. They extended the irrigation and highway systems of the Moche, erected fortresses and began manufacturing pottery in mass, building a solid political and economic base for the elaborate and sybaritic life of the ruling class. The Chimú kingdom was to last until the coming of the Incas in the latter half of the 15th century.

Clay, stone and gold

The Chimú were great builders, and their structures at Chan Chán in the north of Peru near Trujillo are probably the finest examples of the builders' art in the coastal regions of ancient Peru.

Chimú pottery evolved from a number of earlier cultures, particularly the Moche. Yet theirs was an expressionless modeling devoid of any portrayal of the joy, suffering or passion so notable in the Moche ceramics. There is a standardized realism and lack of imagination in this profusion of lustrous black pottery that is in strange contrast to the vigor and spirit of the polychromatic Mochica ware.

The Chimú far surpassed former cultures in the quantity of golden objects they produced. Gold being plentiful, it was used mostly in a pure state, although sometimes alloyed with silver or copper. Concentrating their artistic talents in metallurgy, they attempted

Dangling discs add surrealistically decorative touch to formidable Vicús culture mask of gold alloy.

to imitate nature. They fashioned myriad objects—leaves and minute plants, lizards, butterflies, mice and snakes, which were cleverly placed in natural positions and settings. Birds and insects appear in trees. A parrot nibbles from a golden life-size corn cob, pigeons light on a golden dish. Elaborate golden tweezers decorated with lilliputian animals, golden combs and fillets for the hair are features of their dazzling funerary goods. Perhaps the most evocative example of gold for the cult of the dead are the embossed golden gloves featured in the exhibition (pp. 84-85).

There are two extraordinary pieces which give some idea of the elegance and pomp which surrounded an official procession. One is a chieftain's litter comprised of eight "houses," each containing small human figures of wood, richly dressed and masked in gold. The roofs are decorated with quarter moons and stylized birds. The second is a glittering poncho covered with thousands of gold plaques relieved by a band of cloth decorated with small golden heads.

The most sensational finds of Chimú gold were made in 1937 in the area of Lambayeque. This Batán Grande hoard is deservedly famous. The refinement of the work indicates the advanced methods of the later Chimú craftsmen at a period when ceramic art was declining in quality. Among the finds was a remarkable golden spider with pearl eggs, golden plates decorated with human heads growing from animal heads, fish and animals. A nearby hoard revealed breastplates, bells, flutes and crowns with pendants.

By the middle of the 15th century, less than a cen-

Surely among the most striking of the golden baubles of the world, pair of Moche earspools displays skill of its artisans. Opposite, enlarged detail of disc.

tury before their own destruction, the Incas had conquered the kingdom of Chimór. They had created a vast empire stretching from central Chile north into southern Colombia. They had built a network of some 6,000 miles of roads. Until the coming of the Spaniards less than 100 years later, they wielded undisputed power.

The legend of the origin of the Incas is absorbing, and gold and silver are interwoven throughout it.

Sometime in the 12th century, according to Inca myth, Manco Cápac and his sister-wife, Mama Ocllo, left the Island of the Sun, in the highest large lake in the world, Titicaca. As son and daughter of the sun they went forth to found the Inca Empire, "The Kingdom of Gold." They named their capital Cuzco, a Quechua word meaning navel of the world.

The ancestral god of this embryonic empire was Inti, the sun. The pantheon included Mama Kilya, the moon; Ilyapa, the thunder and lightning; Cuyca, the rainbow. Gold was the Sweat of the Sun and silver the Tears of the Moon. Having divine qualities, they were reserved for use by the Inca (as the ruler was known) and his court, the descendants of the sun.

It was a dispute over the division of the empire between the two sons of the ruler Huayna Cápac that led to the disastrous civil war between Atahualpa and Huascar, which made Pizarro's conquest so much easier. The empire, creation of so many years' making, was destroyed by a handful of Spaniards in a few months. What we have left is an impressive legacy, a part of which is this breathless display of the goldsmiths' art, the potters' imagination and the weavers' consummate skill.

To be sure, only a small portion of what can be seen in the Mujica collection, or in any other for that matter, is a product of Inca craftsmen. Almost all of that was either melted down in the crucibles of the Spaniards or, some say, hidden by the Incas in the vastnesses of the high Andes.

The achievements of the Moche, Chimú and Inca goldsmiths reached a peak of artistic and technical skill, but perhaps equally impressive to our mechanically oriented culture are the architectural monuments and the highway communication systems built upon the successes of earlier peoples and perfected by the Incas.

The messengers that we see in such detail on Moche pottery used an extensive coastal and valley road system. The famous royal highway of the Incas, the Capac Ñin, incorporated this early system into its 6,000-mile network. One road connected Quito in the north to Cuzco in the central region and went on to the Maule River in Chile to the south, passing through the dizzying heights of the Andes. Another followed the coast, often straight as an arrow mile after mile. Transverse roads in the valleys completed the network. This system is considered to be the most accomplished achievement in planning of ancient America. In many places paved with stone, in others cut in the living rock of the Andes or suspended on bridges over precipitous chasms, the roads averaged about 20 feet in width. The Inca *chasquis*, the messengers, could

travel in relays from Cuzco to Quito, a distance of 2,500 miles, and return in 10 to 12 days. Nothing in Europe compared to these roads from the time of the Romans until the advent of Napoleon. Without adequate communications, it would have been impossible to hold such a far-flung empire together; indeed, the roads were built more for this purpose than for trade and commerce.

The highways not only knit the empire together, they also facilitated the unification of the indigenous cultures. Along the length and breadth of the empire we find architectural remains testifying to this aspect of life. The typical monumental use of stone without mortar, the stone terracing and irrigation systems, the elaborate plans of the Inca settlements, the omnipresent officials who regulated almost every aspect of the Indians' lives—all these things were functions of the communications system at the disposal of the Inca.

To the Incas, gold reflected the glory of the sun god, Inti, and became valuable only in the form of ceremonial objects—jewelry, figurines, tomb and temple objects. The Spaniards worshiped gold only as a metal, caring nothing for the miracle it had become under the craftsman's hands. The foreigners' greed for yellow metal puzzled the Incas, who did not use it as coinage.

A major factor in the myth of Manco Cápac, the legendary first lord of the Incas, was the splendor of his person and the gold ornaments he wore. Gold became a religious symbol, a mark of power and nobility. Even the priests prayed that golden "seeds" would germinate in the sacred mountains so that gold would grow there in abundance.

The sun temple, Coricancha, in Cuzco was filled with the finest gold objects befitting the sun—divine ancestor of the Inca dynasty. According to the chronicler Pedro Cieza de León, they displayed magnificently wrought gold altars, fountains, masks, gold-bedecked mummies, fanciful ears of corn, birds and animals, including life-size golden llamas and alpacas. Coricancha held a massive wall-figure of the sun, vividly described by the American historian William H. Prescott as ". . . engraved on a massive plate of gold of enormous dimensions thickly powdered with emeralds and precious stones. It was so situated in front of the great eastern portal, that the rays of the morning sun fell directly upon it at its rising, lighting up the whole apartment with an effulgence that seemed more than natural, and which was reflected back from the golden ornaments with which the walls and ceiling were everywhere incrusted."

There were friezes of gold, doors and doorways covered with gold plate, gold statues, mummies of dead Inca rulers richly caparisoned with gold and jewels, the sacred *keros* or beakers, the plates off which the sun dined, silver storage jars for the sun's *chicha* . . . but the most incredible of them all was the Garden of the Sun.

Within this garden everything was gold and silver—the clods of earth, trees with silver and gold fruit and butterflies and birds on their branches. All was accounted for by earlier chroniclers, Mujica Gallo reports: the "symbolic field of maize with its leaves, ears and heads of corn looking absolutely lifelike; the sacred quinua seed; and to complete this splendid picture twenty gold llamas and their kids, and with shepherds with their crooks, all made of gold."

Even the more ordinary utensils were of gold or silver. Immense jars holding the grain of the Indian corn, containers for perfumes, ewers for sacrificial water, pipes conducting it through subterranean channels into the buildings, reservoirs that received it, even the agricultural implements—all of the same rich metal.

As the splendor of Coricancha increased, in keeping with the expanding empire, so did the pomp of the Inca and his court. Shoes of gold, diadems, golden hems on clothes, gold table service, musical instruments, even his chair was of 16-carat gold, adorned with emeralds. Upon the Inca's death, all such treasures were left in his palace and the succeeding lord began his own acquisition of priceless items.

One can understand the incredulity that possessed the uncouth Spanish soldier and the "golden lunacy" that followed. Prescott wrote: "If the reader sees in this fairy picture only the romantic coloring of some fabulous *El Dorado*, he must recall what has been said before in reference to the palaces of the Inca rulers, and consider that these 'Houses of the Sun,' as they were styled, were the common reservoir into which flowed all the streams of public and private benefaction throughout the empire."

Some believe that the lure of gold sapped the strength of the Incas. In the early days of the Inca state the Sweat of the Sun had divine and mythical attributes. Later it became a symbol of a military and religious caste. Gold not only belonged to the Inca and to Inti, the sun, but even had to be brought to Cuzco and could not be removed from the capital without the permission of the Inca. It has been estimated that between six and seven million ounces of fine gold came to Cuzco each year.

Within a few years of the Spanish conquest most

Chimú *tumi* is ceremonial knife, its shaft topped by a human figure with, of all things, a *tumi* in left hand.

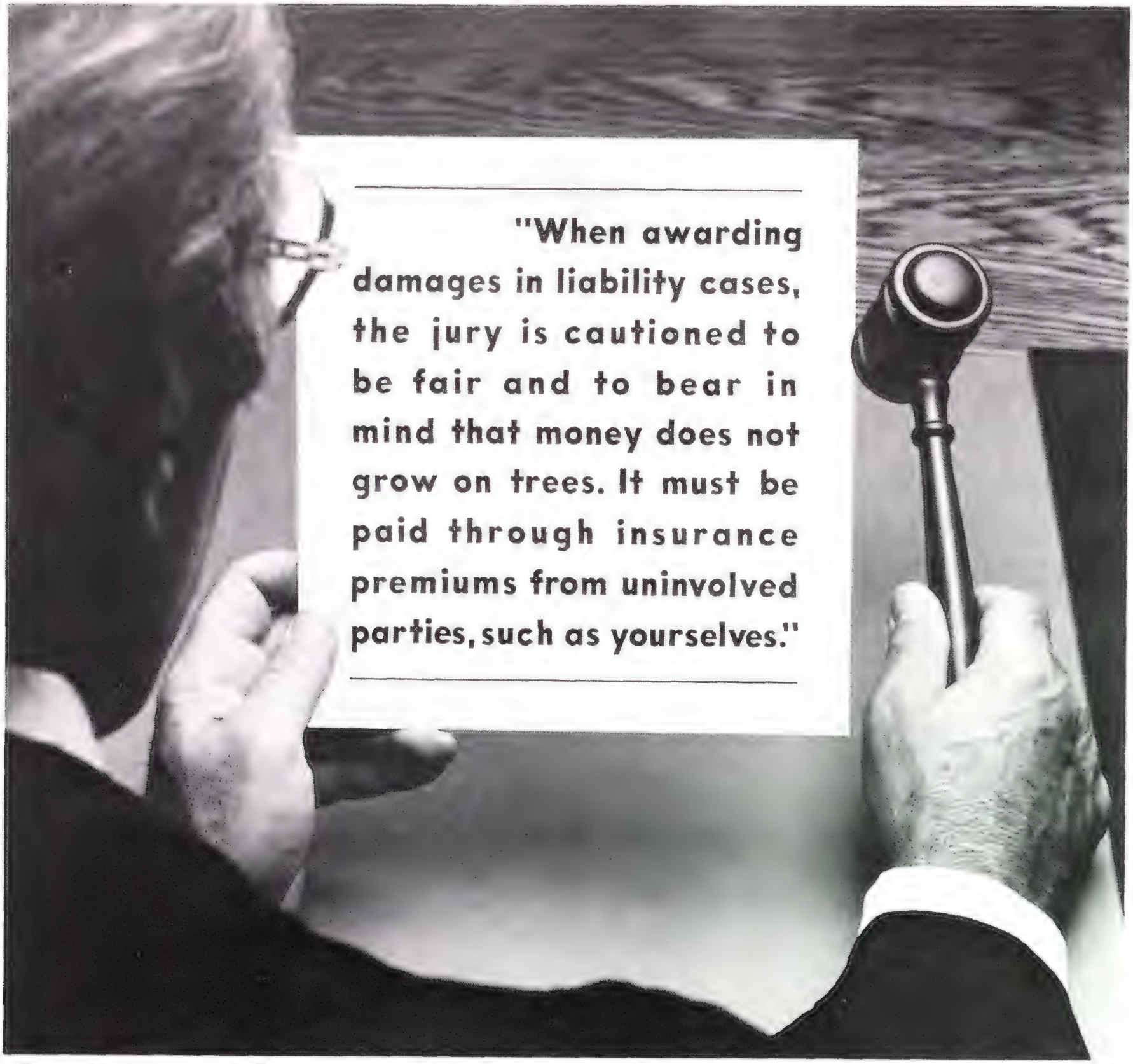
Golden llama, often portrayed in Inca culture, where it was a pack animal and a sacrificial victim.

of the treasure ended up in Spanish crucibles and the river of gold began that was to dazzle Europe and make the name of Peru synonymous with riches.

A list prepared in Seville in 1534 described the treasure brought by Hernando Pizarro: 38 jars weighing from 25 to 60 pounds, two fountains weighing 17 pounds, an idol shaped like a man, 111 pounds. And this was just one of many such troves which only temporarily escaped the melting pots. The most remarkable piece recorded was that of a life-sized llama of 18-carat gold which weighed 5,750 ounces. There was a plate of gold so large that there was no scale on hand large enough to weigh it. Even so, early writers reported that Indians told them only a small part of the Inca treasure fell into the hands of the conquerors.

It has been estimated that the value of the raw gold alone—not counting the great quantities of silver—in the Lord Inca Atahualpa's ransom exceeded $28 million at today's prices. And that was a mere fraction of the treasure the Spanish took from Peru.

Peruvian gold continued to find its way to Europe and North America well after Peru became independent in 1821. Many private collections were sold and are now in Europe and the United States. Fortunately, much is to be found still in Peru. The private collection of Miguel Mujica Gallo has become one of the finest in the world. What began as a hobby grew, became a mission, as over the years he continued to add to the beauty of his collection. It is housed in the Museo Oro del Peru in a suburb of Lima.


"When awarding damages in liability cases, the jury is cautioned to be fair and to bear in mind that money does not grow on trees. It must be paid through insurance premiums from uninvolved parties, such as yourselves."

Too bad judges can't read this to a jury.

In a small Florida town, a decorative boulder rests on the median of a road. A man with three drinks in him and no sleep for 18 hours smashes his car headlong into it. *A jury orders the town to pay him $4.7 million in damages.*[1]

A truck without brake lights is hit from behind. For

"psychic damages" to the driver, because his pride was hurt when his wife had to work, *a jury awards $480,000 above and beyond his medical bills and wage losses.*

Then there's the one...but *you* can probably provide the next example. Most of us know hair-raising stories of windfall awards won in court.[2] Justified claims should be compensated, of course. Ætna's point is that it is time to look hard at what windfall awards are costing.[3]

What can we do? Several things:

We can stop assessing "liability" where there really *was* no fault—and express our sympathy for victims through other means.

We can ask juries to take into account a victim's *own* responsibility for his losses. And we can urge that awards realistically reflect the actual loss suffered—that they be a fair *compensation,* but not a reward.[4]

Insurers, lawyers, judges—each of us shares some blame for this mess. But it is you, the public, who can best begin to clean it up. Don't underestimate your own influence. Use it, as we are trying to use ours.

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[1] This case is being appealed by the town. In addition to the court-awarded damages, two other defendants (the contractor and the county) settled out of court for an additional $1.15 million. This illustrates how extravagant jury-awarded damages set a standard for extravagant *out-of-court* settlements—the real problem, since most liability cases *are* settled out of court.

[2] A by-product of such awards has been a quantum leap in the number of personal injury and property damage suits filed. A 1976 study in California shows such suits increasing at *five times the rate of population growth.*

[3] Most awards are paid by insurance, and insurance companies spend millions more defending policyholders against lawsuits. The direct result is rising premiums for automobile and other liability coverages. The *indirect* result is higher prices for goods and services—prices which are boosted to cover the skyrocketing insurance premiums of manufacturers, doctors, hospitals, and others who are targets for windfall awards.

[4] For example, it would help if juries were simply required to take into account payments the claimant has already received for medical bills and lost wages. Under the present system, these bills may be paid all over again.

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Sometime in the 1980s, a space shuttle will eject a solar collector, as shown here in three stages.

By Richard S. Lewis

Space prospect: factories and electric power

The vacuum and zero gravity of space are ideal for generating electricity and making stronger metals, purer medicines

The testing of NASA's space shuttle (SMITHSONIAN, May 1977) means that we are about to begin industrial exploitation of space. Indeed, in not too many years we shall see minifactories out there. Although less exciting than the Apollo-Saturn era and its cliff-hanger voyages to the moon, exo-industrialization will be far more significant as a social and economic phenomenon. It implies not only the manufacture of ceramic, optical, electronic, metallurgical and biological products of higher quality than can be attained on Earth, but eventually a breach in the constraints on growth imposed by Earth's dwindling resources. As Konstantin E. Tsiolkovski (1857-1935), a Russian space pioneer, wrote: "The Earth is the cradle of mankind, but one cannot forever remain in the cradle."

Such prospects may seem fantastic, but they are not just wishful thinking. In its projected evolution, the space age is comparable to the European discovery of

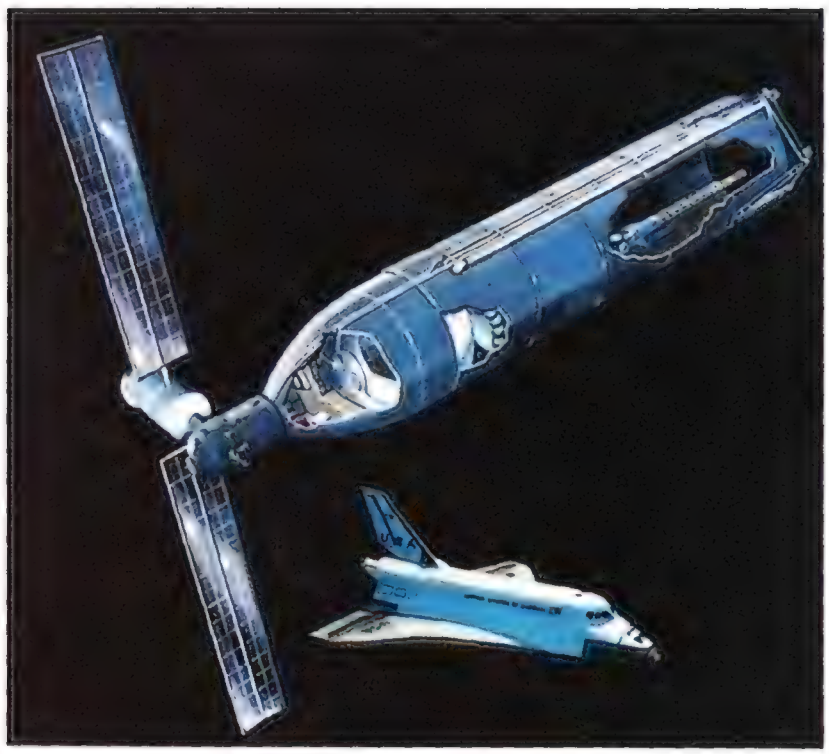
Orbital power station collects solar photons, transforms them into direct current, then beams the energy to Earth in the form of microwaves, where it is converted to alternating current for customers.

America and the development that followed. What's out there? Solar energy collected by stations in geosynchronous orbit and transmitted to Earth by microwave generators, essential minerals that can be mined on the moon, and asteroids rich in iron, nickel and other elements.

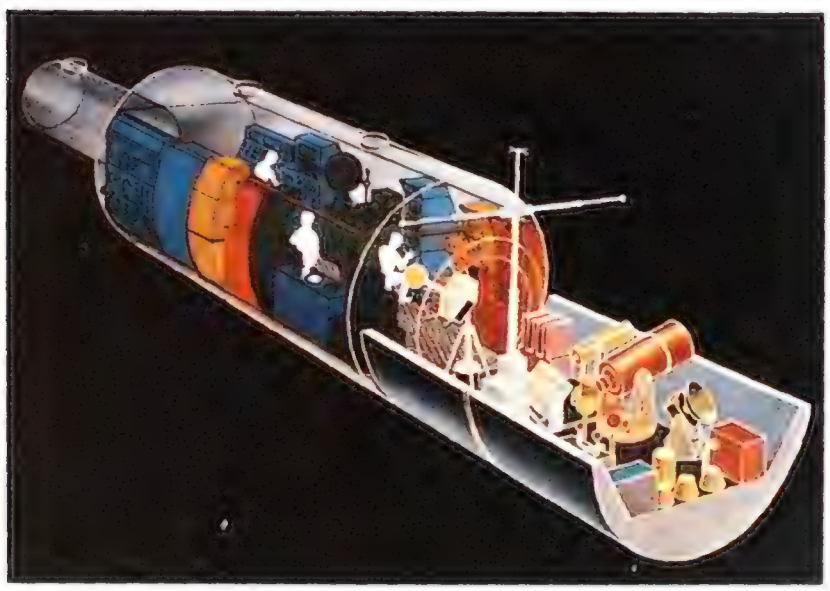
More immediately, the prime industrial assets of the interplanetary medium are nearly perfect vacuum and zero gravity. These conditions provide an environment unobtainable on Earth for the manufacture of products that require a high degree of purity and structural uniformity. One key process that could be carried out in orbit is containerless smelting. Early this year on a suborbital flight of a Space Processing Applications Rocket (SPAR), beryllium was melted in an electric furnace and resolidified while continuously suspended in an electromagnetic field. Crucible contamination is probably the most serious limitation to the art of high-quality glassmaking for laser optics; in zero gravity the molten material could be kept away from container walls by a magnetic field.

Crystals can be made far more homogeneous in orbit than on Earth. Gravity influences the movement of matter in both liquid and gaseous phases of crystallization. Local variations in mass give rise to buoyancy separation and thus to convection currents and, in liquids, to stratification. Such discontinuities degrade the performance of crystalline substances, including metallic ones, when they harden. In space, we could produce superquality microwave-guides, high-power rectifiers, integrated-circuit chips, magnetic switches, photovoltaic cells, lasers, relays, light-emitting diodes, holographic storage devices, optical fibers and com-

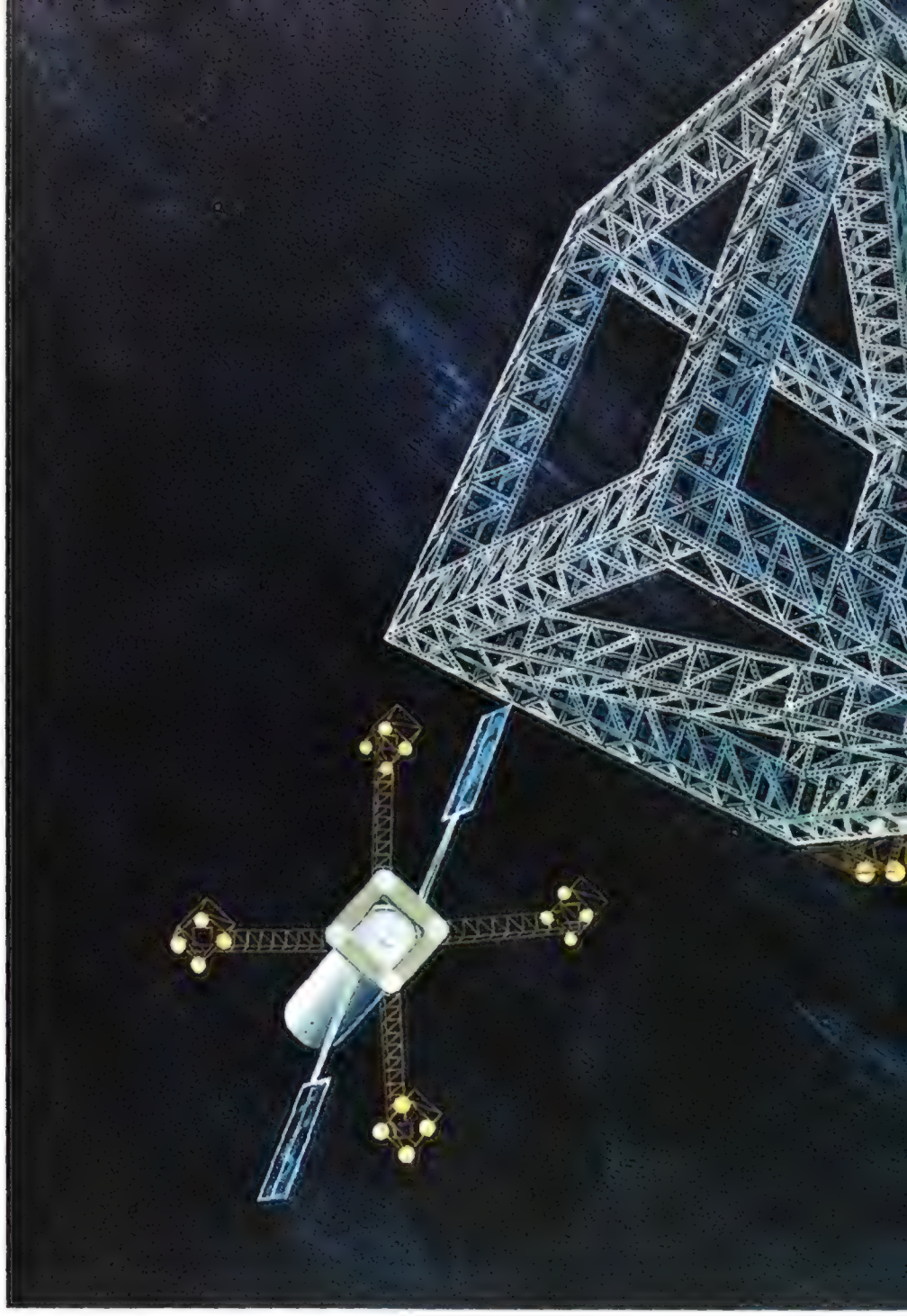
Mr. Lewis is a former editor of Science *and is the author of* From Vinland to Mars.



Winglike solar panels provide electrical power for space lab provisioned by shuttle.



Cutaway of ESA orbital lab shows equipment for experiments and astronomical observations.

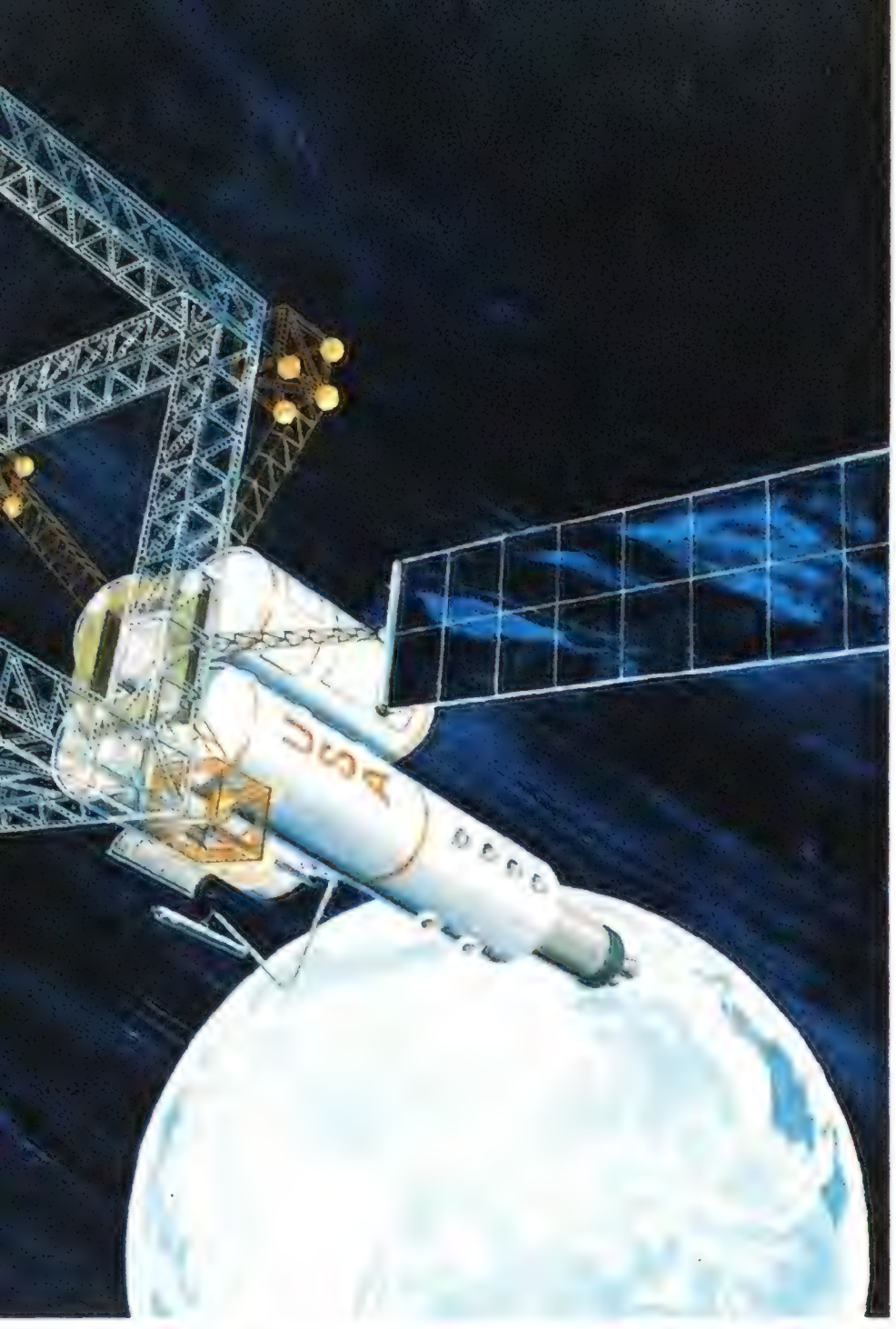


In the mid-to-late 1990s construction may begin on a large-scale solar-power satellite. Illustration

puter memories. The market for them will be enormous. Indeed, a study by the Aerospace Corporation suggests that communication satellites with improved components could make possible microwave links with innumerable low-power ground terminals. These "wrist radios" would be no larger or heavier than a digital watch, might cost as little as $10, and could communicate with any other terminal in the world keyed to the satellite.

European Space Agency (ESA) headquarters in Paris has received many proposals for materials-processing experiments aboard a manned space laboratory (left, bottom) being built by a consortium of ten Western European nations to go up with the shuttle, including a zero-gravity process for making wire from alloys of high current capacity.

A ductile, superconducting alloy operating at the temperature of liquid hydrogen (—239.9 C) would greatly conserve energy in long-distance power transmission lines, and would be of incalculable value in



depicts initial fabrication of structural member in geosynchronous orbit 36,000 miles out.

large generators and high-speed magnetically suspended trains. Zero-gravity processing could also substantially improve the homogeneity of vaccines, proteins, enzymes, hormones, immunoglobins and blood-cell preparations, which could be administered to patients in orbital hospitals.

Congress may ultimately beef up funding for satellite power development as well. Peter D. Glaser, a vice president of Arthur D. Little Company, argues that only solar cells in orbit can provide the "perpetual" energy society needs as an alternative to diminishing fossil and dangerous nuclear fuels. He has proposed a satellite array in geosynchronous orbit with a collecting area 13 by 14 kilometers and a one-kilometer transmitting antenna. Photovoltaic silicon wafers would convert sunshine into electricity at a rate of perhaps 5,000 megawatts, five times that of nuclear power plants now in construction. Direct current would be fed to generators that would beam it as microwaves to Earth with 70 percent efficiency. Ground receiving stations would reconvert the microwaves into electrical energy and distribute it to utility customers.

However, a satellite power station would require a post-shuttle supply system and development of advanced space engineering techniques. Glaser has calculated the initial cost of a 5,000-megawatt space powerhouse as $7.6 billion (in 1974 dollars), plus operating costs of $136 million a year. Each subsequent station would be cheaper. He says the total investment could be repaid with about 60 satellites.

Space cannons and catapults

The central constraint in large-scale industrial operations in space is the transportation cost from Earth. NASA and industry experts think it may be cheaper to get basic raw materials from the moon simply because the escape energy required would be only 1/20th as much as for launchings from Earth. We need rockets to attain the seven-mile-per-second escape velocity imposed by the mass of the Earth, but lunar escape velocity is only about one-fifth as great.

According to David R. Criswell of the Lunar Science Institute and Gerald K. O'Neill (SMITHSONIAN, February 1976), professor of physics at Princeton University, it would be feasible to catapult lunar ores to a collection zone, whence they could be hauled by space barge to an Earth-orbiting smelter powered by solar rays. O'Neill, the leading academic advocate of space colonization, thinks an electromagnetic catapult could launch 1,440 tons of lunar rock into orbit weekly. Some engineers have proposed a gas cannon, 245 meters long with a barrel radius of one meter, that would deliver payloads weighing up to five tons at least three times an hour. Either of these systems could be built today.

But how would the moon rock be mined? Krafft A. Ehricke, one of the von Braun team pioneers and Rockwell International's chief future projectioner, figures that a kiloton of nuclear explosive detonated below the regolith or surface rock would fracture 80,000 cubic meters, or 330,000 tons, of oxygen plus aluminum, silicon and titanium, of which perhaps 20 to 30 percent might be recoverable. If a neighboring cavity were filled with hydrogen, he speculates, it would act as a sponge and "we would obtain water in the form of steam which could be harnessed to generate energy." The water could then be split back into hydrogen and oxygen for rocket propellant.

Richard J. Williams of NASA headquarters objects that "we have too little hydrogen on the moon . . . we would have to import it." But James Arnold, professor of chemistry at the University of California, San Diego, estimates that there may be 100 cubic kilo-

meters of water deposited as subsurface ice in the polar regions of the moon, a volume equal to the contents of Lake Superior. The poles receive less sunshine than other areas and primordial water may not have volatilized and escaped into space.

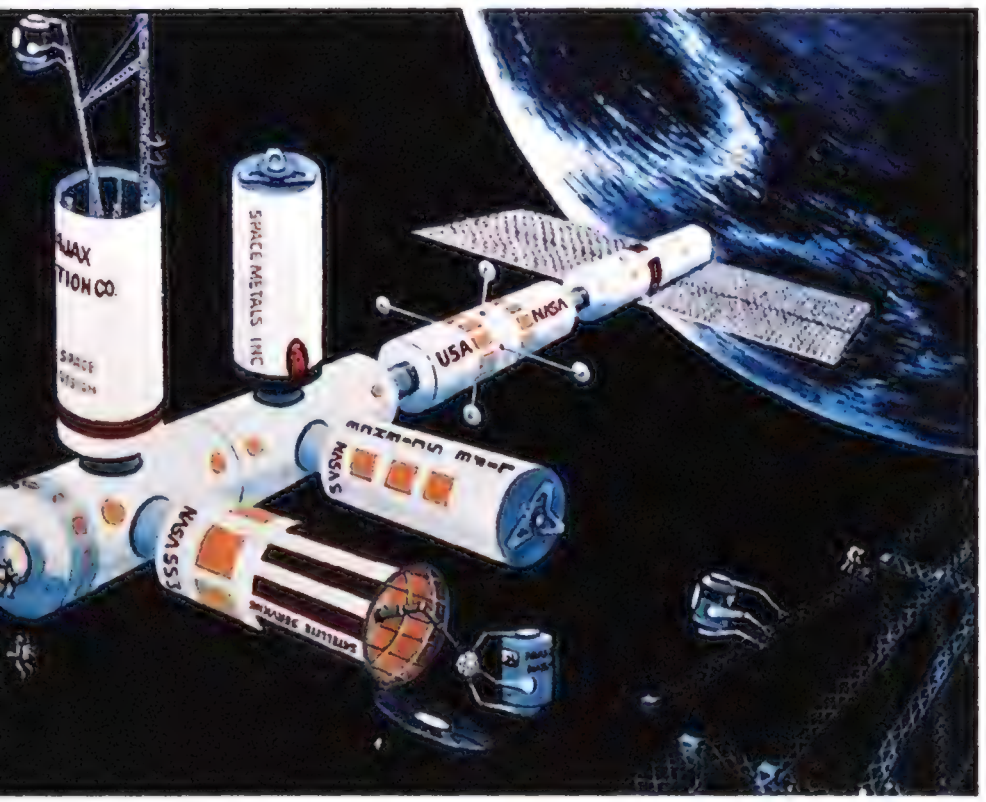
Beyond the moon, of course, swing the nearby asteroids, some with iron and nickel concentrations of 20 to 100 percent, according to Michael J. Gaffey of the Massachusetts Institute of Technology. One cubic kilometer of nickel-iron asteroid dropped off in an orbit near Earth would be worth about $5 trillion, he estimates, and could provide a 200-year supply of nickel and enough steel for 15 years at current planetary use rates. We'll need it, because in a generation or two all the low-cost extractable iron on Earth will have been exhausted.

Speculation has centered on those asteroids whose paths intersect the orbit of the Earth, and calculations have already been made of the amount of energy it would take to alter the trajectory of an asteroid about one kilometer in size, such as Icarus. Discovered in 1948, Icarus virtually grazes the Earth at a distance of four million miles. Gaffey and others have also suggested it may be feasible to shift some asteroids into accessible orbits by nuclear propulsion.

The key element in the near term will be the permanent space station. Several designs have been developed for NASA. Perhaps the simplest is a cylinder 33 feet in diameter proposed by McDonnell Douglas Corporation. It would serve as a "common module" to which additional sections could be added as required. Two such modules would provide work and living areas for a crew of 12 for 90 days without resupply from Earth. Eight or nine modules could accommodate a crew of 50 men and women. Although now seven years old, this design remains a basic one and has been studied thoroughly. The 33-foot-wide module was sized originally to fit on the Saturn 5 booster, replacing the third stage. A basic module of smaller dimensions—possibly the size of Spacelab, 47.75 feet long and 13 feet in diameter—would be required to fit the shuttle's cargo bay. Whichever is chosen, NASA is now turning to the development of a basic space station for the 1985-86 time frame.

The question of how space will be administered is now coming to the fore as well, because development may include such diverse projects as satellite management, astrophysical observations, lunar mining, asteroid collection, orbital manufactures, energy production, medical experiments, space hospitals and even tourism and recreation.

Although the exo-industrial revolution is still in the brainstorming phase, NASA has asked industry to submit proposals on methods of packaging, transporting, fabricating and operating large structures in space to be demonstrated in 1983-84, and to refine its concepts for satellite power systems. Some of the notions now being pushed may sound grandiose, but they cannot be taken lightly, for science has a way of catching up to fiction. Anyone who bets against the development of space, with all it portends for the future social evolution of mankind, is defying a well-established historical trend.



Second-generation laboratories may be built by 1989 to develop advanced zero-gravity metallurgy.

It is the year 2025, and this mile-diameter space colony is substantially independent of the Earth.

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Glazunov in front of Jesus in the *Mystery*.

By S. Frederick Starr

Soviet painter poses a question

A rhetorical painting whose message nobody seems certain of, Ilia Glazunov's magnum opus is a curious production for a Russian artist

Last summer Moscow was thrown into an uproar over what one man did with a roll of canvas and a few pounds of paint. And, although the painting in question has not yet been seen publicly in the Soviet Union, the controversy continues—there, and elsewhere. The man is the artist Ilia Glazunov, 47, suave, popular, well established in his profession. The wall-size painting, titled *The Mystery of the Twentieth Century*, was to have been the centerpiece of Glazunov's one-man show at the prestigious House of the Artist, near the Kremlin. Newspapers had announced the exhibition. Hundreds of cognoscenti and foreign diplomats showed up for the opening. But authorities banned the *Mystery* from the hall and Glazunov abruptly withdrew from his own show. Within hours, newspapers from Topeka to Tokyo were proclaiming Moscow's latest art scandal.

Scarcely had news of the event sunk in when dis-

A billboard-size advertisement-style painting, 10 by 20 feet, melodramatic in both style and in content, the work might have been commissioned by a Hollywood czar. A labor of many years, but agreements arose as to its meaning. To some, the six-inch brass padlock on the door was proof that art in the USSR once more was feeling the grip of political authority. Word that the painting featured such non-Soviet notables as Mao Tse-tung, Hitler and Golda Meir gave credence to this interpretation. And when Glazunov himself defended his painting to Western newsmen as "a work of philosophical realism," his place in the martyrology of Moscow "dissidents" seemed all but assured.

No sooner was such information sown among Moscow's corps of foreign correspondents than contradictory evidence began popping up. Far from being some struggling "nonofficial" painter, as those who refuse or

unappreciated by official Moscow, and to this day unseen there, the painting seems to seek

are not permitted to join the Union of Artists are called, Glazunov turned out to be very much in favor. He had been rewarded with a publication devoted to his work, a commodious studio apartment and—rare for an artist—freedom to travel abroad. When it was recalled that Glazunov had published articles on the "culture of Patriotism" in the most orthodox journals,

to sum up the modern era by a kaleidoscopic extravaganza of people and personalities.

all doubt that he was a company man was dispelled.

What is the painting that caused such a furor? Covering the entire end of Glazunov's studio, the 10-by-20 foot extravaganza defies easy categorization. Like the mainstream of Soviet official art, the *Mystery* is representational, but its subject matter is decidedly different. It attempts to portray the entire era in which

Inspired by success of medieval style of the late 1960s, Glazunov painted *The Tsarevich Dmitrii.*

we live. The canvas is organized chronologically and, like Larry Rivers' *The Russian Revolution* (SMITHSONIAN, July 1977), is to be "read" from left to right.

At the threshold of the century we encounter Czar Nicholas II, holding in his arms his hemophiliac son and heir, Alexei, who is painted to resemble a saint, corona and all. Towering nearby, but looking more like a weak plaster statue than a living man, is Lenin.

In the foreground we encounter a knot of Lenin's contemporaries whose creations defined the culture of our era. All are either foreign or somehow in disrepute within the USSR. Ernest Hemingway and Louis Armstrong are also there, and so are Pablo Picasso, Leon Trotsky and, sticking his tongue out, Albert Einstein. If the novelist Maxim Gorky is a more nearly orthodox figure in such company, it should be recalled that he is thought to have been murdered by an envious Stalin. In the midst of this diverse crowd floats the painting *Black Square on a White Ground* by Russia's pioneer abstract painter of the Teens and Twenties, Kazimir Malevich. Though once a leading innovator on the Russian and European art scene, Malevich's bolder works remain largely unknown and unexhibited in the Soviet Union.

Proceeding by decades, Glazunov turns next to the war years. Dominating the central section of the canvas are Hitler and Mussolini, unlikely subjects, to be sure, for Soviet art. By comparison to these serious and powerful-looking figures, Churchill and Roosevelt are made to appear like chubby, good-natured schoolboys. Stalin himself is portrayed as a medieval king, lying in state on his bier draped in crimson. Glazunov leaves us in no doubt as to his positive view of Stalin. Not only is Stalin portrayed as a stronger presence even than Lenin, but he is given the central place on the canvas and, by implication, in the century.

In Glazunov's conception, the postwar decades appear as a period of decadence and decline. Nude women, debauched weekends, a murdered John F. Kennedy and the Beatles are all the era has to offer. Leonid Brezhnev did not earn a place in Glazunov's pantheon, but Mao Tse-tung and Moshe Dayan did.

Christ and the Devil (in the form of a sinister astronaut) are also in Glazunov's cast, and peering from the right-hand corner of the *Mystery* stands Alexander Solzhenitsyn, his prison number from the Gulag Archipelago still sewn to his shirt. Complementing Solzhenitsyn on the extreme left of the canvas, Glazunov placed himself—dapper in an Edwardian collar and holding a Lilliputian staircase upon which a lone figure is ascending. According to the artist, this tiny figure is also Glazunov, presumably acting out mankind's lonely ascent.

This is his painting. But what about Glazunov the man? From his own writings and from conversations with his friends and patrons, a complex picture emerges. Born to a well-educated Leningrad family, Glazunov had an uncle who taught at the Conservatory and his father was a respected historian. Both of Ilia's parents died of starvation during the grim two years' blockade of Leningrad in 1941-43. Only with the greatest difficulty was the young boy evacuated from the city on one of the truck convoys that eluded the Germans by crossing the frozen Lake Ladoga. In 1951 he gained admission to the prestigious Repin Art Institute in Leningrad.

By the time Glazunov moved to Moscow in 1957, he had already earned a reputation for his portraits. After a few local successes with the Soviet elite and with foreign diplomats in Moscow, he began hunting bigger game. He bagged Federico Fellini, King Gustav of Sweden, Indira Gandhi and Gina Lollobrigida. In the post-Stalin "thaw" such recognition was welcomed by the Soviet government. When exhibitions in Paris, Rome and Copenhagen included paintings by Glazunov, he had arrived.

Firmly part of the establishment now, Glazunov played no part in the rise of the so-called "unofficial art" in the 1960s. His later claim that "I started it all" rings false, for even if he shocked Moscow with a nude portrait of his wife back in 1957, Glazunov never broke with the traditional techniques that he was taught in Leningrad. Meanwhile, others were trying desperately to make up for the ground lost during a quarter-

Secretary of Kennan Institute for Advanced Russian Studies, Woodrow Wilson International Center for Scholars, the author has written widely on Soviet life.

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century of isolation from avant-garde currents abroad. This is not to say, however, that Glazunov had become simply a hack, as his critics contend. True, he produced political bombast on command, at construction sites and during an extended tour of Vietnam in 1967. But his illustrations for the novels of Dostoevsky indicate that his very personal penchant for introspection and brooding remained, and found expression in his art.

During the late 1960s Glazunov finally seems to have found what he had been seeking, in the passion for the art and culture of medieval Russia that swept the Moscow elite in those years. The virtual collapse of the hope of creating a universal "Socialist Realism" in art had left a vacuum which many Russians hoped to fill by returning to the national and religious heritage of their prerevolutionary past. In such paintings as *The Tsarevich Dmitrii* (p. 104) Glazunov showed the positive side of this current. Its negative side was a narrow chauvinism and frank longing for the iron rule of Stalin, as the only means of keeping in check the decadence which was felt to be infecting Russia from the West. Glazunov shared this as well.

How did Glazunov move from Holy Russia to *The Mystery of the Twentieth Century*? Cynics said he did it on command. They point to the 1973 book on him, which concludes with the hope that "in the future his paintings on ancient history will yield their place to works on more contemporary themes, carried out in the full-blooded tradition of realism." Whatever his motives, Glazunov in the *Mystery* certainly exploited contemporary themes, though they are by no means the ones that a Communist Party committee on the arts might propose. So heretical is Glazunov's subject matter, in fact, that it has led many to wonder whether he had not joined the dissidents.

The problem with this view is that it wrongly assumes that the wall between official and unofficial culture in the Soviet Union today is firm and unyielding. While the distinction may be drawn in extreme cases, it has generally become quite blurred. Many formerly independent artists have now joined the Moscow City Committee of the Union of Graphic Artists, a tolerant but certifiably official body. On the other hand, the range of subject matter deemed acceptable for official artists has also broadened. Suffice it to say that even after the scandal over Glazunov's big painting, *Pravda* published four of his drawings, as if to say that all was well. If Glazunov is to be called a dissenter at all, his central positioning of Stalin and his fear of rising decadence from the West marks him more of the Right than of the Left.

His adherence to a safely representational style further supports this conclusion. Whether he is judged to be a politically adroit mediocrity, as some think, or a bearer of the long Russian tradition that seeks to pose and answer the great questions of the day through art, as others would claim, Glazunov is as much a mystery as his painting.

In this painting Glazunov, delving in Russian history, dwelt on the murder of Peter the Great's son, symbolized by dagger. The Kremlin is in back; artist's son was model for prince.

Oh, I always wanted one.

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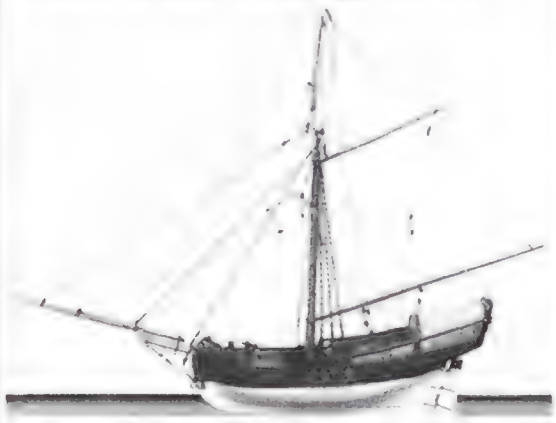

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Young zoo visitors may not know which way tracks go, but can follow them.

By Wolf von Eckardt

This way out– from our mad jumble of signs

At the National Zoo and on the Mall, new pictographs point the way– even if you don't know how to read

To find the lion house in Washington's National Zoo, just follow the paw prints on the paved walkway. To find the Museum of Natural History on the Mall, just look at one of the three-dimensional orientation maps beside the roadways. It will show you not only where the building is located, but also what it looks like.

The lion tracks and the maps of the Mall are parts of recently installed graphic information systems that make it easy to find your way.

That is something of a novelty in this country and, we may hope, a sign of the times. Not that we lack road signs. We have far too many. We are over-signed and under-informed—with a thicket of poorly designed, hard-to-read, often puzzling directional, warning and information signs that confuse and irritate us. Unlike the zoo signs, they assume that we are all literate, alert and eagle-eyed.

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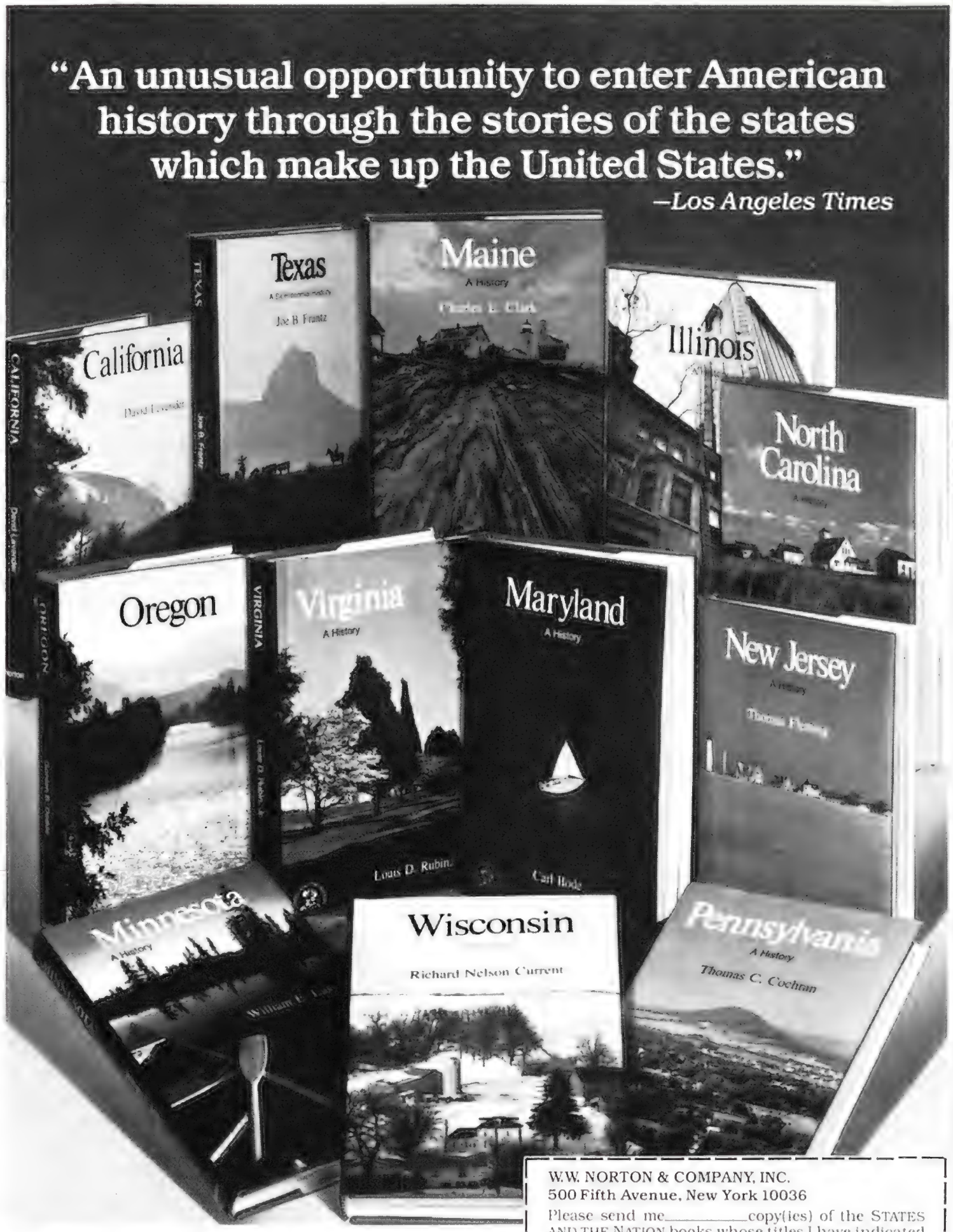

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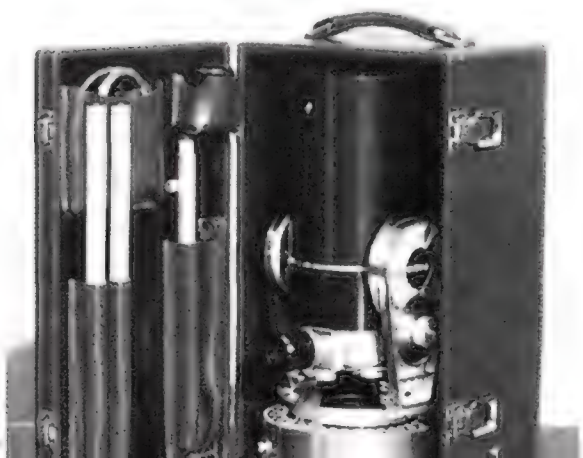

PED
X
ING

is my favorite example of traffic-engineered gobbledygook. A lot of peds, I am afraid, are likely to be run over while trying to figure that one out.

On just one block of a typical American street you can count at least a dozen official traffic signs, to say nothing of a clutter of traffic lights, street lights, poles, posts, standards, parking meters, police call boxes, fire alarm boxes, mailboxes, mail storage boxes, fire hydrants, trash cans, trash and, if it is a business street, a noisy jazz of advertising.

The name of the street, often as not, is lost in this jumble. Street signs are usually placed so that they are all but impossible to see from within a moving automobile, which is where most people are when they look for a street sign. But even if you do find one, the peekaboo game is not over. Most signs tease you with small, white, condensed capital letters on a green background. It is a combination which, as any typographic expert will tell you, achieves near-perfect illegibility and frustration.

Most traffic signs on the street yell "NO" at you before you can decipher what it is you are not to do—NO parking, NO littering, NO loitering, NO left turn, NO, NO, NO. There is a lot of small print. Signs that say "NO PARKING," for instance, often have lengthy footnotes to the effect that you may indeed park when rush hours are over. Our reaction to this incessant nagging often tends to be sullen indifference.

On the typical American highway the signs are bigger but not better. Many highway signs are poorly (not to say idiotically) placed. On Washington's 14th Street Bridge, to cite one instance, the sign indicating the way to National Airport was, until the Bicentennial, on the wrong end of a panel that spanned all the lanes and listed five other possible destinations. The trouble was that to get to the airport, you had to make a sharp right turn only three hundred yards or so beyond the panel, which still bears *no* sign for the George Washington Memorial Parkway, off the same turn. The vital airport-turn information was provided on a road sign so small and placed so low that you could not see it if a van or a medium-size truck was just ahead of you.

American traffic engineers rely almost entirely on words. Like airline captains, they are chatty but rarely eloquent. BRIDGE FREEZES BEFORE ROADWAY they will inform us, for instance, conveying this confidence in their favorite upper-case letters on their favorite green billboards as you drive along at 55 miles per hour. If there actually *is* ice on the bridge (and it is not even easy to recognize bridges, the way our highways are designed), you may have eternity to ponder the meaning of the message.

Finding National Airport sign is no longer a speed-reading challenge.

If you are driving in most of the rest of the world, you don't get an obscure minilecture on thermal physics but a dramatic picture of what happens when the road is unexpectedly covered with ice. You will see a triangular white sign, made vividly visible with a bright red border, showing a skidding and swerving out-of-control automobile.

Most of the rest of the civilized world has long since discovered that graphic symbols, pictorial devices, pictographs, pictograms—call them what you will—are far more effective in getting a message across than a lot of verbiage. A telling picture image is instantly recognized, which is important in fast-moving traffic, and does not depend on language and reading ability, which is especially important for illiterates, foreign tourists or recent immigrants.

Von Eckardt, Washington journalist and an architecture critic, has seen the best and worst of directional signs.

To give you an idea of diamond values, the piece shown is available for about $1600. Your jeweler can show you other diamond jewelry starting at about $200. De Beers Consolidated Mines, Ltd.

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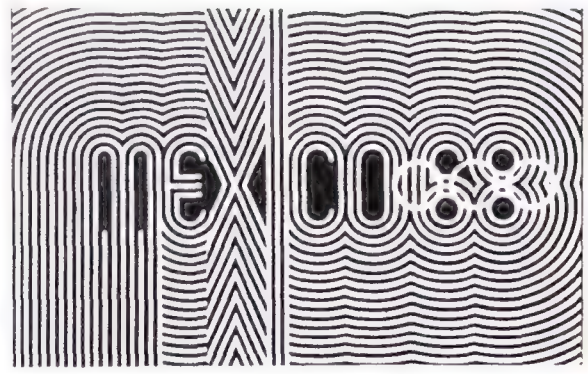

Parallel-line motif, from Huichol Indian design, formed Games logotype.

Olympics design theme was followed even on Mexican postage stamps.

The use of symbols to control and direct traffic seems to have originated in England, where the first motorists were required to supply a pedestrian ahead of their sputtering new contraption to warn of its approach. With the Motor Car Act of 1903, the British instituted a primitive system of road signs. It was refined and adopted by the automobile clubs of France and Germany, and on October 11, 1909, after long deliberations, the first international road-sign agreement was signed. More recently, in 1968, the international signers of the United Nations Convention on Road Signs and Signals adopted similar codes.

The United States is one of the few countries in the world which has its own chaotic traffic signs. Many American state and local highway departments still resist the international pictogram system, abiding instead by our own national sign standards, which, like the Bible, are not to be tampered with. The code may have killed more motorists than the Crusaders killed infidels.

More than a few international symbols, nevertheless, have begun to make a surreptitious appearance. Local highway engineers change the pictograms, use them in different colors and formats, and add lettering—all of which only creates more confusion.

Short of an act of Congress, we are not likely soon to get a uniform system on the American road. We are, however, increasingly using, and getting used to, off-highway symbols in places like Olympic Games, airports, world's fairs—places where foreigners are likely to congregate.

The Department of Transportation commissioned the American Institute of Graphic Arts to develop a set of graphic symbols to ease the travel of airline, railroad, bus and subway passengers. The result is 33 lucid pictograms along with guidelines for their use. With the endorsement of the Federal Design Improvement Program, one of the many noble ventures of the National Endowment for the Arts, more pictograms are being developed.

It would be a tremendous step out of the street jungle if the Transportation Department would make it mandatory to have them installed at all ports and stations that receive federal subsidies. The symbols are useless, however, unless they are utilized as an integral part of an in-

Grasshopper sculpture inspired sign for a Mexico City subway station.

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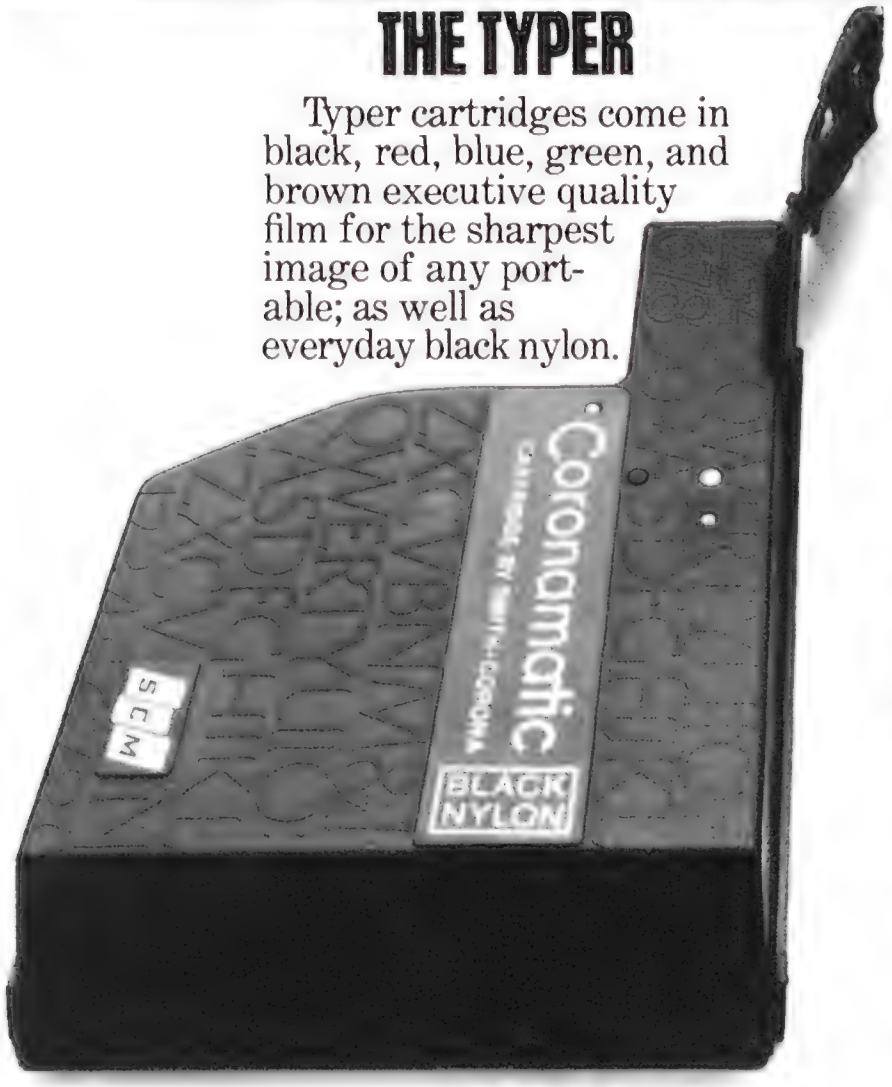

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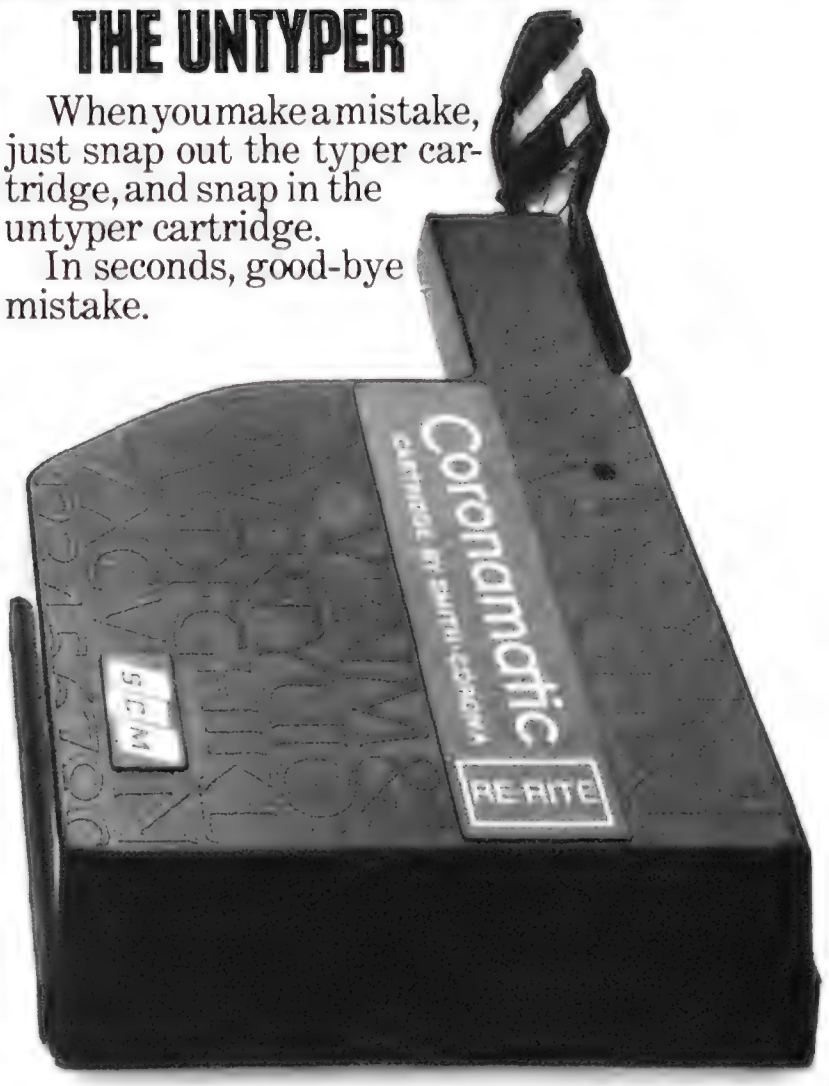

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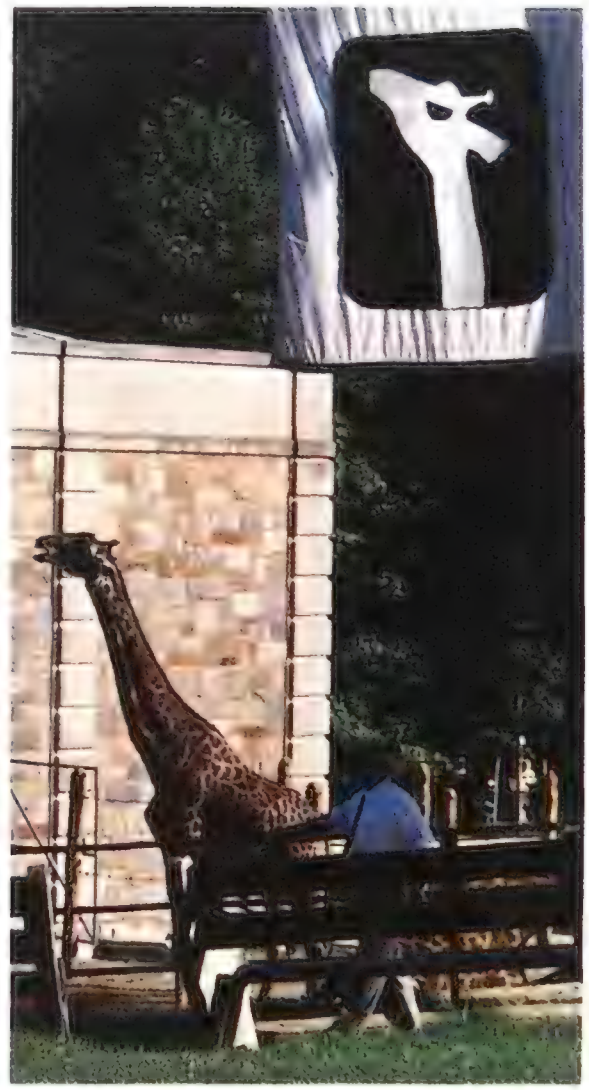

Animal profiles, like giraffe's, identify National Zoo locations.

telligent, total design system, as AIGA official Thomas H. Geismar has so wisely pointed out.

The next most important, as well as a delightful, advance in visual communication was made by an American graphic designer—in Mexico. The Mexicans put Pedro Ramírez Vásquez, one of their most talented architects (he designed their Museum of Anthropology) in charge of organizing their 1968 Olympics. Ramírez Vásquez wanted an outstanding graphic designer. He called the office of design consultant George Nelson, which recommended a young man no one had ever heard of—Lance Wyman.

Wyman, whose most recent accomplishments are the afore-mentioned graphics for the Smithsonian Institution's zoo and its museums on the Mall, went to Mexico City and took charge, although he did not know a word of Spanish. Together with industrial designer Peter Murdoch, who came from England and did not know any Spanish either, he first of all went to work on a logotype, or symbol, for the XIX Olympiad. The two developed it out of Mexico's pre-Hispanic past and Indian present. They combined the title "Mexico 68" with the traditional five interlocked Olympic rings, and used that combination to form a rich pattern of parallel lines in the manner of ancient pottery stamp motifs and recent Huichol Indian wool designs. The Huichol create fascinating patterns of parallel strands of brightly colored wool.

The overall impact of the Olympic graphics was close to exhilarating. The designers did not miss a chance, nor did the Mexicans deny them any. Everything from postage stamps to billboards, from admission tickets to information kiosks and giant balloons, conveyed the Olympic identity. There was astounding variety on a consistent theme.

Before Wyman returned to New York, he repeated the feat for Mexico City's Metro, the local subway. Each of the stations has distinct architecture and Wyman gave each its own graphic symbol. It appears, along with the name of the station, inside the structure, on entrance signs and on the Metro map. Chapultepec shows a grasshopper because the name means "grasshopper hill" in the Nahuatl language spoken by the Aztecs. Sevilla shows the remnant of a colonial aqueduct which is near the station. Merced is the name of a market area.

Some signs take a moment's thought, but zoo visitors figure them out.

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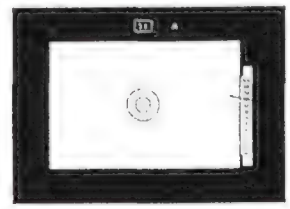
Know thyself. First of all, look ahead to what you'll want to do with the camera. Most manufacturers, including Minolta, offer a tempting array of features. To name a few: interchangeable finders and viewscreens, motorized film winding, self-timers, multiple-exposure capability and automatic exposure control. If you'll be using them, fine. If not, save yourself some money by cutting out the frills. Don't buy more camera than you need. Or less.

Match-needle or electronic auto-exposure? Minolta makes both kinds, so our only concern is that you get what's best for you.

A match-needle camera costs less. To set exposure, you line up two needles in the viewfinder. It's easy, fast and accurate, but you do the work. Minolta's match-needle models, the SR-T 200, the SR-T 201 and the SR-T 202, differ in price, according to their operating features.

Minolta's electronic automatic models are the professional XK, the deluxe XE-7 and the economical XE-5. In these cameras, shutter speeds are controlled electronically with unprecedented precision. Even if the light changes the instant before you shoot, the camera will set itself for correct exposure. Among Minolta electronic SLR's, you get a wide choice of features, including interchangeable viewfinders and focusing screens, shutter speeds to 1/2000th of a second, and multiple-exposure capability.

How much information should the viewfinder display? The more information in the viewfinder, the more you know about the technical details of how the camera is taking the picture. If this means a lot to you, pay the extra cost. If not, save some more money by getting a simpler model.



Minolta XE-7 viewfinder

The important thing about Minolta SLR's is that in every single one, you can compose, focus, set exposure and shoot without ever looking away from the viewfinder. So you won't miss shots of even the fastest-moving subjects.

How does the camera feel and sound? This can tell you a lot about how well thought out the design is. A camera shouldn't take "getting used to." Your fingers should fall naturally and comfortably into place over the controls.

Advance the film wind lever. If a new camera has a "grainy" feeling, how will it feel after a couple of thousand shots?

How about noise? Close machine tolerances and careful damping of moving parts in Minolta cameras give you a noticeably smoother, more solid response when you push the shutter button. And Minolta's automatic SLR's have a newly designed electronic shutter that's a joy to hear because you almost can't hear it.

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Minolta

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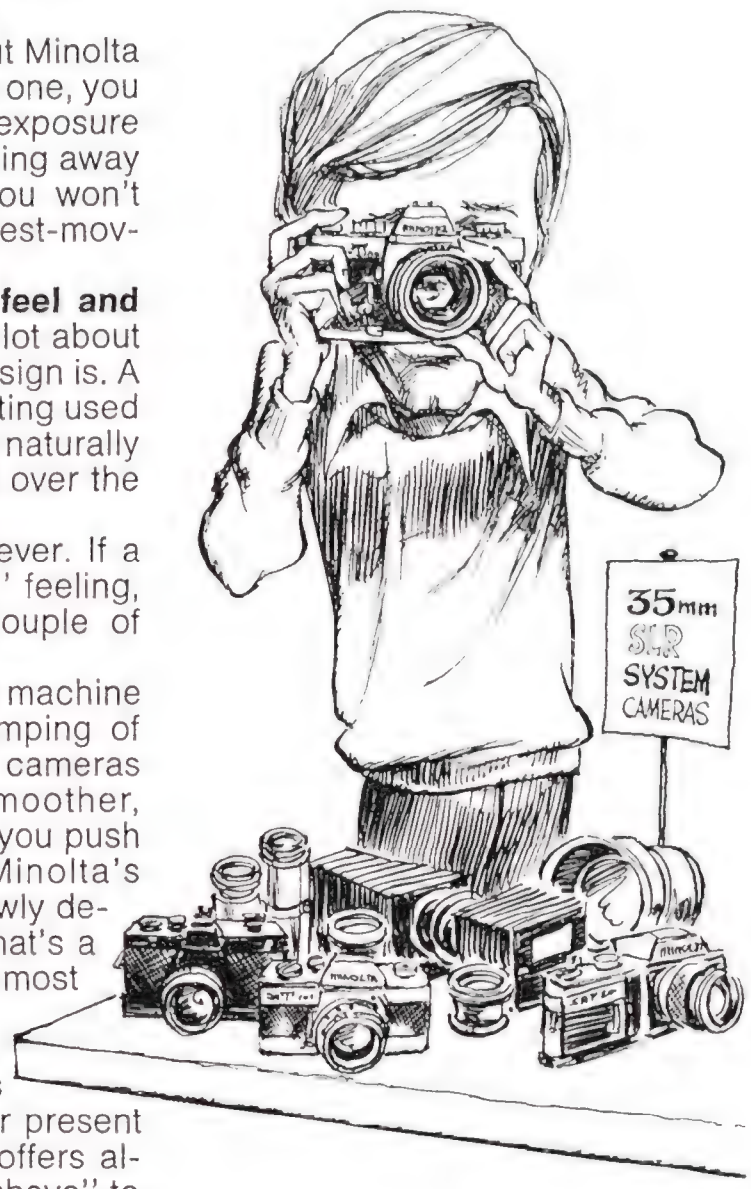
How easy is it to change lenses? You shouldn't miss any shots while changing lenses. So Minolta has developed a patented bayonet mount that locks on in less than a quarter turn, instead of the three or more turns required by a screw mount.

And unlike others, the Minolta bayonet mount doesn't require realignment of f/stops every time you change lenses.

How do you judge craftsmanship? Take a close, careful look at the details. Everything should be tucked in neatly. Finishes should be even and unmarred. No machining marks should be visible, even inside.



Cameras have reputations. Check them out. By all means, ask your friends about Minolta. Since it's the largest-selling imported camera brand in the U.S., chances are someone you know owns one.

If you'd like more information about Minolta 35mm SLR's, write to Minolta Corp., 101 Williams Drive, Ramsey, N.J. 07446. In Canada: Minolta Camera (Canada), Inc., Ont.

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Eve Tempted, an 1842 Hiram Powers sculpture, has been translated . . .

. . . as the symbol for Washington's National Collection of Fine Arts.

so Wyman drew a crate of apples to symbolize its station.

Again, the graphic symbols help people who do not easily read (and that includes a good many Mexicans) or who do not easily read Spanish. More important, they tie the subway to the history and traditions of the city, adding to its sense of place and pride.

After his return to this country, Wyman went into partnership with Bill Cannan, with whom he had studied at the Pratt Institute and who also had worked for George Nelson. The graphics for the Washington zoo and Mall are the work of their firm.

Its zoo designs are part of a master plan drawn up by the architectural firm of Faulkner, Fryer and Vanderpool, with Lester Collins as the landscape architect. The plan is gradually restoring dignity to the capital's 167-acre animal display, which had been laid out originally by Frederick Law Olmsted, but which had been allowed to turn into a near slum.

Wyman and his partner were asked to reduce the number and variety of signs and to show people what there is to see and how to get there.

Under the new master plan there is one main esplanade, Olmsted Walk, from which a number of trails loop through the woods past the various animal exhibits. The graphic designers gave each of these trails a color and a symbol that depicts the most prominent animal housed on the trail. Animals are shown in head profile because in full figure the duck would be as big as an elephant and the elephant as small as a duck, and that did not seem fair to either. In profile, it somehow doesn't matter that each animal is shown in the same size.

At every junction of the walk and trail, Wyman and Cannan have a large signpost, or totem, which carries not only the animal symbols but panels with such information as walking time, trail routes, and pictograms of food, telephones, rest rooms and other services. There is also the symbol of the trail itself—the footprint—paw, claw or hoof—of the principal animal in residence. Waterproof cutouts of these tracks are also bonded to the trail's blacktop pavement (p. 108).

It is all very colorful and festive. Small children delight in being able to locate their favorite animals all by themselves. My only regret is that those 16-foot-high signposts are so overwhelming. What are totem poles doing in Washington, anyway? No matter.

I am pleased that Wyman and Cannan also were asked to design what planners call "street furniture"—the benches, drinking fountains, information kiosks, waste receptacles and map stands. They have handsomely consolidated all these sundry items in sensible units which harmonize with the signs.

The wastebaskets, for instance, are alongside the benches where waste is generated. Special consideration (low drinking fountains and telephones, among other things) has been given to people in wheelchairs. It is good (and rare) to see thought given to the way we furnish a public environment.

The spirit of the design—and the refurbished zoo, for that matter—is well symbolized by the new logotype. It was probably inevitable that the National Zoo be represented by a bald eagle. But Wyman's eagle is not the fierce, predatory, imperialistic bird that American patriots venerate in the Great Seal and kill from airplanes. The new National Zoo eagle symbolizes what the zoo's director, Dr. Theodore Reed, considers the mission of all good zoos: it is not only to acquaint us with living animals but also to preserve threatened species. The zoo logo shows a parent bald eagle feeding and comforting a chick.

Invited to recommend a visitors' orientation program for Washington's Mall, Wyman and Cannan thought it especially important to identify the various museums between the Capitol and the Washington Monument. They did this by placing three-dimensional maps—vertically mounted architectural scale models made of cast resin—at handy intervals. The maps are housed in open kiosks and flanked by panels with information about the museums, bus routes and the like in various languages.

Again, each of the famous structures has its own symbol. Some, like the White House, depict familiar architecture. Most of the museums are symbolized by the nature of their displays. The Wright brothers' airplane stands for the National Air and Space Museum. A pair of gears represents the Arts and Industries Building. A Henry Moore sculpture representation symbolizes the Hirshhorn Museum and Sculpture Garden.

Banners on Olmsted-designed light pole identify Smithsonian and its castle.

These same symbols, along with the Smithsonian's sunburst emblem, appear on banners mounted on the lighting standards along Madison and Jefferson Drives, identifying the buildings they stand in front of. The graceful lampposts they now decorate originally were designed by Olmsted.

All in all, the Smithsonian's venture into intelligent and intelligible graphics will, I hope, set a standard around the country. It is high time.

"Star Spangled Banner" waved over Fort McHenry in 1814 British assault.

Adaptation of flag is this symbol for Museum of History and Technology.

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Prang combined Victorian Christmas moods in this 1882 card: sentiment over children, fanciful fun with animals, a touch of the celestial—a cherub chariot.

Louis Prang, Christmas-card producer, sought the colors of his native Germany.

By Lynne Cheney

You can thank Louis Prang for all those cards

To brighten the Victorian Christmas this immigrant started a fad that now gives Postal Service a headache

Although it was the Christmas season of 1882, J. E. Bell, superintendent of the District of Columbia Post Office, was not feeling particularly cheery. Christmas cards were everywhere, overflowing the sorting tables, stuffing the carrier cases, spilling out of the mailbags. Bell surveyed the inundation of Christmas mail and told a *Washington Star* reporter who had dropped by, "I thought last year would be the end of the Christmas card mania, but I don't think so now. Why a few years ago a Christmas card was a rare thing. The public then got the mania and the business seems to be getting larger every year." Bell had 16 extra men helping him already, and he didn't even want to think what the next Christmas would be like. "I don't know what we'll do if it keeps on," he grumbled.

Behind Superintendent Bell's troubles —and the far greater Christmastide troubles of all his successors—was a tall, in-

tense German immigrant named Louis Prang. In 1874, at his plant in Roxbury, Massachusetts, Prang began producing Christmas cards. He sent his first year's production to England, where Christmas cards were already overloading the British mails (a *Times* correspondent declared them a "great social evil"). But the next year, 1875, Prang turned to the United States.

At that time only a few Americans were sending cards, and most of them had been making do with European imports or with fancied-up business cards picturing holiday scenes. Once Prang began to supply a readily available native product, the relatively rare American Christmas-card habit exploded into a national epidemic, involving Americans in droves, as Superintendent Bell could have testified.

Louis Prang had the right idea at the perfect time. He caught the enthusiasm for Christmas that had been building up out of a variety of 19th-century moods, attitudes and events. The influence of the Puritans, who had never really approved of Christmas, was on the decline. Romantic notions of childhood, which Christmas expressed so naturally, had captured the country's mind and heart. Writers popular in America, like Charles Dickens and Washington Irving, had created literary models of a warm, convivial celebration. Finally, the Civil War had generated sufficient wealth, in the North at least, to flesh out such fantasies with a pleasant reality of goose and turkey, greens and presents.

The Civil War years also saw a very practical development which readied the stage for Prang's success. Before 1863, if one sent a letter to a friend, the odds were that the friend would either have to pay a carrier to deliver it or make his way to the post office to pick it up himself.

This 1878 card bows to religion, a rare element in Prang's products.

Under such conditions a painted Christmas card could hardly be expected to arouse warm, positive feelings. But in 1863 Congress authorized the Postmaster General to establish free mail delivery in large cities. During the next few decades, the system was extended until one could be sure that a letter sent to an urban friend would reach him without costing him anything in money or effort. As the government hired hundreds of postmen to deliver city mail, the country became ready for the Christmas card.

Prang's cards, however, were more than just a well-timed commercial success. Given that they were a mass-produced popular art form, it's not too much to call them a kind of esthetic triumph. Leafing through the dusty scrapbooks in which Victorian girls pasted family cards, one is struck again and again by Prang's high standards of art and craftsmanship.

And so Prang intended. Practically from the time he stepped off the ship that brought him to America, he was bothered by how little color and beauty his adopt-

Cherub in a tree plays with birds, magically impervious to winter's snow.

Mrs. Cheney's SMITHSONIAN *article in May 1976 described the 1876 Centennial exhibit in Philadelphia.*

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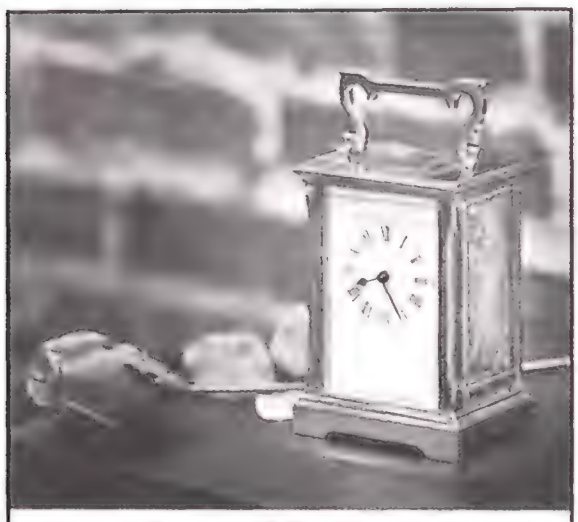

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The fond bird's heart is bealing.
But I am heartily sincere
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Humanized animals delighted the Victorians. Prang's frogs and geese could be celebrating any occasion; the copy enlists them for Christmastide.

ed countrymen had in their lives. Rich Americans might hang elegant paintings in their homes, but the masses of people that Prang observed lived in rooms seldom brightened by color. If their homes were decorated at all, it was likely to be only with the portraits of a few dour ancestors. To change that gradually became something of a mission with Prang.

His own youth had been abundant with design and bright with color because his father had owned a calico factory in Prussia. Prang was a sickly child (the doctors mysteriously blamed it on "whirlwind poisoning"), so he frequently missed school. But as he followed his father around the factory, he absorbed knowledge of another kind. His days were filled with taking in the details of color mixing, printing and dyeing.

He reached manhood just in time to be caught up in the great wave of liberal revolutions that swept Europe in the late 1840s. The failure of those revolutions sent him, like so many other Germans, into exile. He set out for the United States and, after five weeks in steerage, landed in New York.

Prang tried his hand at a number of occupations, but came more and more to concentrate on lithographic printing, a process whereby images on stone were transferred to paper. The idea of lithographing in color particularly fascinated him. It had been done before. Prints had been created in three or four colors, each of them from a different stone. But Prang got it into his head that much finer effects could be obtained. He had a vision of being able to make quality reproductions of art masterpieces, reproductions that could brighten those Victorian parlors.

By the mid 1860s, he knew enough to begin. He reproduced two oil paintings, one a landscape and one a farm scene. There was outraged reaction from culture purists who called Prang's reproductions "frauds" and "shams," but the popular verdict was in his favor. His "chromolithographs," as he called them, became a standard feature in the average Victorian home. Nor was there any denying their craftsmanlike standards. One popular Prang chromo required 45 different color stones, and the artist spent almost a year preparing them.

Prang displayed his work at the Vienna exhibition of 1873 and publicized his display by handing out business cards chromolithographed with flowers. The cards themselves proved such a hit that the wife of Prang's London agent suggested that he print holiday greetings on them and sell them as Christmas cards.

When he saw how wildly popular his Christmas cards were, Prang understood that he had a new weapon to use in his ongoing fight to raise America's esthetic consciousness. It wasn't enough, as he saw it, to produce his cards with patient and painstaking attention to detail, he also wanted the designs to be the finest possible. So in 1880 he initiated a series of contests which, with their cash prizes, tempted some of the nation's most talented artists to try their hand at Christmas card design. Thomas Moran and J. Alden Weir entered Prang's competitions. In 1881, when the noted Elihu Vedder won first prize, the *New York Evening Post* remarked, "It is easy to see that art is advancing in this country, when Elihu Vedder makes our Christmas cards."

The excellence of Prang's cards was recognized throughout the world. Crown Princess Victoria of Germany ordered her cards from him. British manufacturers instituted their own prize contests to try to compete with the Prang product. A London critic of the Nineties looked back on the Prang cards of the Seventies and Eighties and wrote, "Both for their intrinsic merits and the influence they had upon English taste, it is not easy even now that their novelty has faded to speak of them except in superlatives. . . . Considering them apart from any comparison, how good they are! Not merely in

Chromolithographed poster of merry dancers advertised Prang Christmas cards.

Why Edwin Newman believes it is better to give than to gift.

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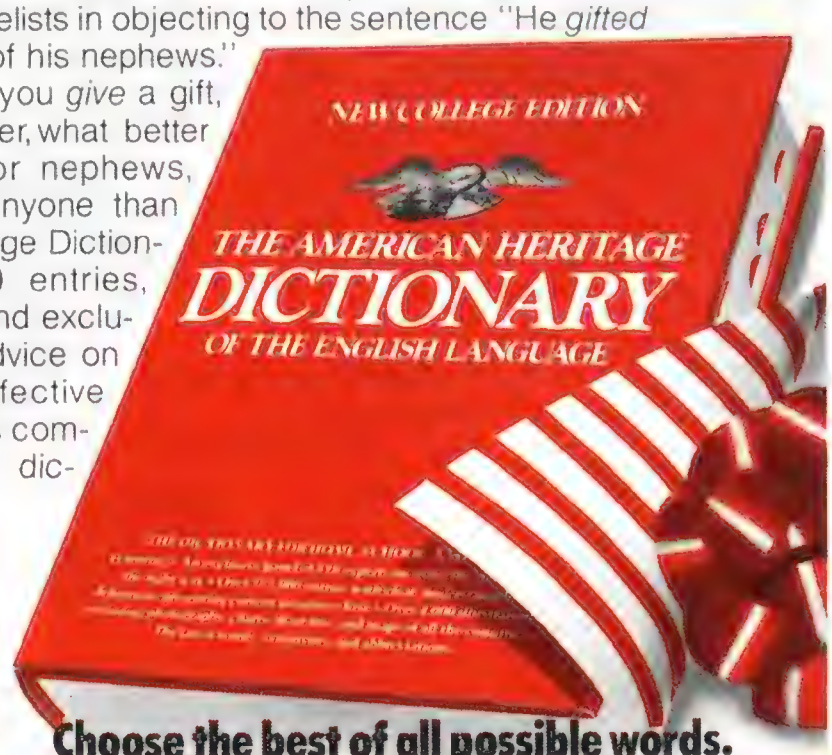

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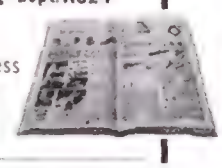

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design, but in colour, they have, for the most part, a singular charm."

As is often the case with excellence, Prang's cards were relatively expensive. Once he had opened the American market, European importers scrambled after increasingly large shares of it with cheaper cards, until finally in the 1890s Prang, refusing to compromise his product, gave up publication of Christmas cards entirely. He kept up his battle to elevate American taste with an education project aimed at schoolchildren, but the days of the elegant Prang chromo cards were over.

Today his Christmas cards are collectors' items, prized partly for their distinctive period flavor. His Santas ride the bicycles and talk into the telephones of a century ago. His children exist in a dreamy, magical, innocent world. At least most of them do. Like so much 19th-century art, Prang's cards also picture the disturbing prepubescent girls who have occasioned so much hindsight psychoanalysis of the Victorians. They peer out at us from his cards, seductive and coy.

Prang's Christmas cards are infrequently religious, and many carry the note of pagan myth and legendary fancy. Fairies are often indistinguishable from angels.

Many period touches serve as catalysts

A prize card of 1880 reflects romantic attitude toward childhood. A youngster's

to insight about the Victorian temperament. One frequently repeated motif involves animals cast in human roles. A mother cat fans her baby in a crib. A beruffed dog extends his Christmas greetings. Why did our ancestors find that so amusing? Was it some kind of perverse reaction to Darwin?

Or there are the flowers: musk roses, cyclamen, honeysuckle, daisies. To us they seem inappropriate as Christmas card decorations, but the 19th century loved them. Was it because our ancestors were more at the mercy of the weather than we? At the depths of the winter solstice in a drafty Victorian house, were images of spring and summer perhaps a relief?

Through all the children and elves and flowers that speak of another time shines the almost unvarying quality of Prang's cards. It characterizes even the slightest production. A dandy is twitted for his fancy Christmas dress or a suffragist for wanting to overthrow men at Christmas. The mood is light, but the register is unfailingly precise and the finish typically flawless. Prang's cards not only hint at 19th-century America's frame of mind, they offer to the 20th century an example of how art of sorts entered into even the commonest customs of life.

dreams are carefully detailed in
the smoky glow from the blazing fire.

Read this and cry.

Froilan lives in the highlands of Guatemala in a one-room hut with dirt floors and no sanitary facilities. Labor there is so cheap that, for men like Froilan's father, hard work and long hours still mean a life of poverty. But now life is changing for Froilan.

Her name? We don't know. We found her wandering the streets of a large city in South America. Her mother is a beggar. What will become of this little girl? No one knows. In her country, she's just one of thousands doomed to poverty.

The world is full of children like these who desperately need someone to care, like the family who sponsors Froilan.

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Book reviews

Clare Sheridan
Anita Leslie
(Doubleday, $10)

If you loved Jennie Churchill, then make way for her equally extraordinary niece, Clare Sheridan, in this rich-as-a-Christmas-pudding biography by another descendant of the fabled Jeromes, Anita Leslie. Like her famous aunt and the other flamboyant Edwardians Anita Leslie enthralled us with in her earlier book, *The Marlborough House Set,* Clare is the kind of natural heroine whose exploits are too extravagant for fiction and are therefore all the more delicious for being quite true.

Born in 1885, Clare was the daughter of Jennie's sister Clara and that lovable eccentric, Moreton Frewen, known as "Mortal Ruin" for his business acumen. From her earliest years she had the talent to amuse, exasperate, enrage and enslave the passions, lasting devotion and other diverse emotions of men ranging from Rudyard Kipling, Henry James and George Moore to the less aristocratic likes of Lenin, Trotsky, Mussolini, Chaplin, Gandhi and Bernard Baruch, plus simmering squads of lesser-known but similarly smitten swains.

Though called "Puss" by her brother Oswald, Clare was no mere prowling sex kitten. An accomplished journalist and sculptor, widowed by the first World War, her need to support her children echoed Jennie Churchill's dilemma when Lord Randolph died. Clare's first scandalous adventure drove her politically conservative cousin Winston to a Churchillian fury when she sweet-talked her way to Communist Russia and got the top Bolsheviks to sit for her. Lenin was docile but Trotsky went mad for the tawny tigress. On parting, he kissed her passionately and said, "I will keep the memory of a woman with a golden halo of hair and hands covered with clay."

Back in Mayfair, *The Times* gave her £500 for the first installment of her diaries and the *New York Times* syndicated it, thus launching a second career as journalist and professional celebrity. While this might be enough for some, it was just the beginning for Clare Sheridan. She scandalized New York society with her sexual candor, delighted Alice Roosevelt Longworth in Washington,

Clare Sheridan and friend, Charlie Chaplin, in California

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went camping with Charlie Chaplin (plus chauffeur and chef), interviewed Irish revolutionary Rory O'Connor, tracked down Kemal Atatürk and got herself variously involved with the violently changing Europe of the years between the wars.

She lived fully, rapturously, and only toward the end of her 85 years, quietly. As her daughter Margaret said, "She was lovely but embarrassing; as a mother impossible, as a person enchanting. With her superb disregard for consequences, taking risks and making others share them, she was always alive, never dim. . . ."

I devoured this book slowly and lovingly, longing to gulp it down fast but forcing myself to slow down and make the pleasure last.

—*Jeannie Sakol*
Author of *Flora Sweet*

Mixed Families: Adoption Across Racial Boundaries
Joyce A. Ladner
(Anchor Press/Doubleday, $10)

Considering that only about 15,000 black children have been adopted by white parents in the United States and Canada, it is somewhat surprising to learn how much attention these families have received. But, of course, these families are not the American norm, and just about everybody wants to know why whites would do such a thing.

Joyce Ladner, a black sociologist and adoptive mother herself, says from the beginning that transracial adoption is a complicated phenomenon and that pat answers are impossible. She realizes that the most difficult aspect to assess is motivation, and the weakest chapter in the book is the one dealing with this question. Indeed, if Dr. Ladner were to ask my husband and me why we ourselves adopted two black children, our answer could not be easily condensed into neat paragraphs or categories.

She does, of course, come up with reasons: some standard, such as the simple wish to have a child; some not so commonplace, such as a desire to change racial relations in this country. Many parents have had very positive reasons, such as this father: "Our adopting *black* children means that we didn't give a damn about having children. You can put together a family any way you want to. Who is to say that giving birth is

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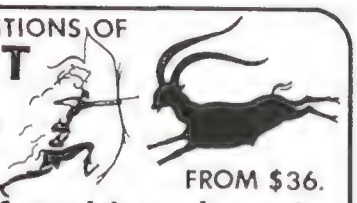

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the only way to have a family?" Others, and it seems too many, were moved only as a last resort: "Sure, I would have taken a white baby if they had had one to offer us as a first choice . . . you might say we settled for second best but . . . we have no regrets."

Although Dr. Ladner's main emphasis is on the immediate family, she also explores the feelings of grandparents, other relatives, friends and neighbors. She finds the going rough for these transracial families. So much so, that a few have been so overwhelmed by the opposition that they consider the entire adoption a mistake, while others have dealt with the hostility by relying on their inner strengths and independence, two characteristics Dr. Ladner finds in the most successful families.

I can't think of any issue Dr. Ladner leaves untouched. She puts the whole issue of black-white adoption in historical context; she records the angry concerns of the National Association of Black Social Workers, who feel white parents are incapable of transmitting a black identity to a child; others feel transracial adoption is a form of cultural genocide against blacks; still others go so far as to declare it an out-and-out genocidal plot. She lets the parents defend themselves against such attacks; she explores the issue of black identity; she allows a few children to talk for themselves. Since very few studies of transracial adoption have been written for the layman, this book fills a special need and should be read by parents who have already adopted across racial lines and by those considering it. A caution, however. In her small sample—136 parents—Dr. Ladner found a considerable number of families who had adopted for the wrong reasons, a preponderance of grandparents who disapproved of the adoption initially, and too many parents who are not considering the black identity of their children.

While Dr. Ladner may be upset with parents, she saves her real anger for the right place—most of the old, traditional adoption and child welfare agencies, as well as insensitive lawmakers. I gladly read chapter after chapter anticipating the one titled "The Politics of Child Welfare," in which Dr. Ladner makes it clear that child welfare agencies have generated the crisis in child welfare we

see now: too many black children in need of permanent homes.

For decades the agencies felt that blacks were incapable of, and uninterested in, adoption; they found it easier to place a child permanently in a foster home than to hunt for an adoptive one; in many cases they never attempted to have a child released for adoption; they have failed miserably in rehabilitating families so that children could return to their biological parents; they have placed children in homes for the wrong reasons.

Dr. Ladner's suggestions for solving the crisis center on recruiting more black parents, cutting out the bureaucratic hassles, providing adoption subsidies for lower-income families and the acknowledgment that some whites can successfully raise black children, but that agencies must be more careful about such placements.

While Dr. Ladner believes a permanent home for a child is better than foster or institutionalized care, she still strongly believes black children (with either one or two black biological parents) belong in black homes. She may not be entirely correct. A recent study at Takoma Elementary School in Washington, D.C., showed that black children from integrated homes serve as a "bridge between the races" and are seen as valued playmates by both black and white children. Some whites adopted black children to change radically American racial conditions. Perhaps it is impossible on the large scale, but a little more probable on an individual basis.

—*Susan L. Butler*
Director, Best Products Foundation

Sailor Historian: The Best of Samuel Eliot Morison
Edited by Emily Morison Beck
(Houghton Mifflin, $15)

Industrious, ambitious and patrician—Samuel Eliot Morison might live on only in academic circles were it not for two traits rarely found together in a scholar. As a historian he had a penchant for researching from life and on location as much as from library stacks. ("He had," his daughter Emily wrote, "the explorer's eye.") And he wrote with a personal flair, in a style that might touch upon the fluorescent but never offend or distract.

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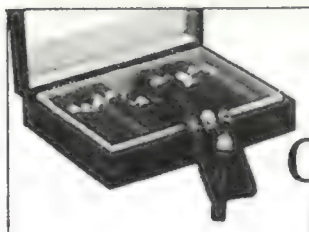

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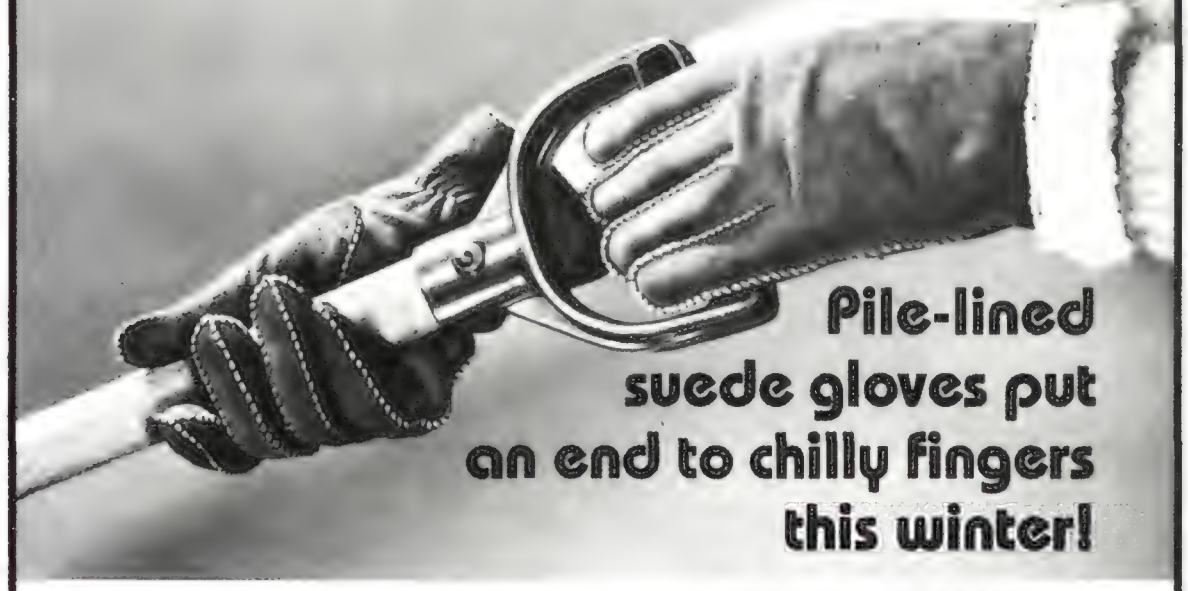

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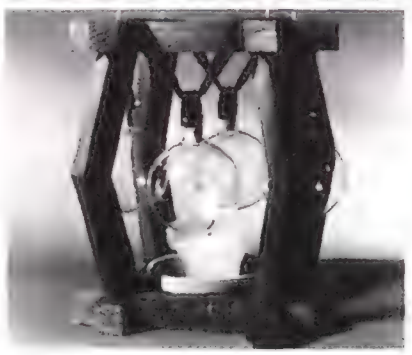

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scholar. But imagination is also a welcome quality and a surprise. One brief example will illustrate Morison's felicitous blending of the two:

A couple of centuries ago, the proper, God-fearing people of Salem, Massachusetts, tired of a boisterous, rowdy element in their midst and so tossed the offenders out bodily. Undaunted, the exiles moved across the bay to found Marblehead (whose people, by the way, are still boisterous, rowdy, independent and proud). Writing in *The Maritime History of Massachusetts* (1921, 1941), Morison paused to describe the newly founded town: "Across the harbor, obscuring the southerly channel, Marblehead presents her back side of rocky pasture to the world at large, and Salem in particular."

Starting in 1913 and working right up to the time of his death last year, Morison published 40 major works of history and more than 100 articles on a variety of topics. Out of this body of scholarship and personal commentary, his daughter, Emily Morison Beck, selected what she felt would make "a highly readable treasury of the best and most representative of SEM's writings." Morison himself then refined her selections, rejecting here, suggesting there, providing an introduction to each of the final choices. The happy result is a vade mecum of Samuel Eliot Morison, historian, critic, teacher, social commentator.

Among the 34 pieces are the predictables. Morison's re-creation of a day at sea from his epic biography of Columbus is one, and its inclusion is welcomed. Another, and perhaps less welcome, choice is the "Conclusion to the War in the Pacific," from *The Two-Ocean War*. The latter offers Morison's personal assessments of the admirals who directed that war, a curious bit of self-flattery that can't begin to measure up to his ringing account of the battle of Coral Sea earlier in the same book. But that is to condemn the wine for a bit of cork in the bottle.

Beyond the predictables are some lesser-known gems. Especially captivating are "History as a Literary Art," an energetic essay that should be memorized by all doctoral candidates, whatever their field, and (my personal favorite) "An August Day's Sail." This last piece, a brief chapter from *Spring Tides*, seems to sum up Morison's feelings for the sea, which played such a vital part in his life. It is vintage Morison, wonderfully evocative.

Six-and-a-half decades of writing are represented in *Sailor Historian*, and not one phrase seems quaint or out of time, not one sign of effort appears. Ignoring for a moment his impeccable scholarship, that observation alone ought to place Morison irrefragably (a favorite word of his) among the greatest of American historians—with Prescott, with Parkman, with the Beards.

—John E Warner
Boston-based writer and critic

Samuel Eliot Morison where he liked to be, aboard ship.

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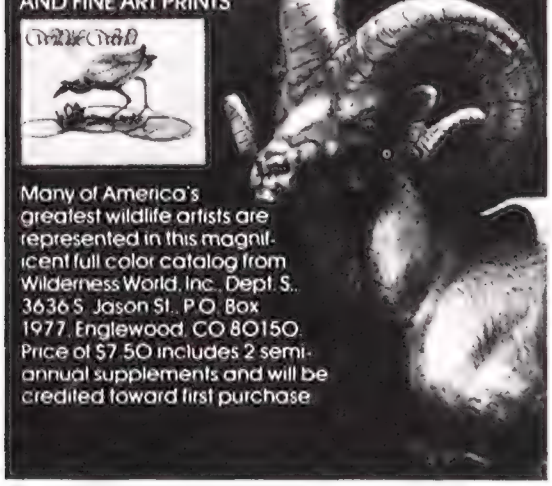

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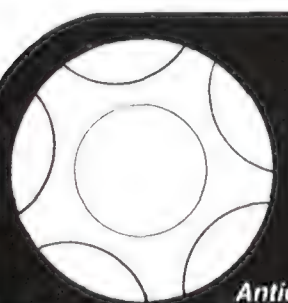

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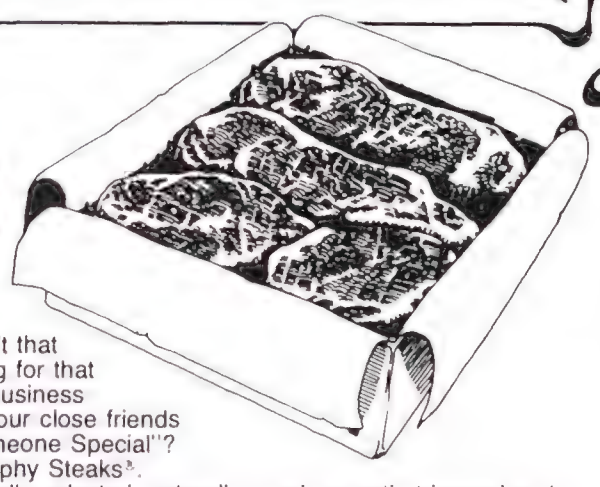

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Smithsonian highlights

To celebrate the holidays

Seasonal activities at the Smithsonian might include ice-skating, caroling or sketching an endangered animal.

A Hirshhorn Holiday
The museum presents its annual Christmas gift to Washington's children—a day of puppets, clowning and music—December 3, 10 A.M. to 4 P.M. It's free—especially geared to children age seven and up.

To Celebrate the Moment
The Cooper-Hewitt Museum in New York has gathered together a collection of objects designed for days of celebration—Christmas, Hanukkah, New Year's Day and birthdays, through December.

The Trees of Christmas
Twelve Christmas trees will dazzle the spirit with their showy handmade decorations at the Museum of History and Technology—beginning December 16.

Sketch-In at the Zoo
On December 18 Zoo visitors will be invited to draw the animals.

Ice-skating
The ice-skating rink on the Mall, east of the Museum of Natural History, is open for the winter season.

December openings

Murals in the Round: Painted Tepees of the Kiowa and Kiowa-Apache Indians
These 25 richly decorated deerskin models of Kiowa tepees were made from 1891 to 1904 at the request of the Smithsonian. This show opens on December 2 at the Renwick Gallery.

New Ways With Paper
The National Collection of Fine Arts will have an exhibit of 50 objects which expand the usual concept of paper uses in the arts, including layered, bent, folded, torn, dyed, embossed and handmade paper—opens December 2.

The Decorative Designs of Frank Lloyd Wright
The show presents 60 Wright-designed objects—stained-glass windows, glassware, fabric and wall coverings. This Renwick exhibition opens on December 16.

Kids As Architects
Twelve drawings by 7-to-12-year-olds of wildly imaginative buildings will open December 16 at the Renwick.

Srinagar: Pageant of Indian Costumes
Fifty-four authentic costumes from India were selected for this show on the basis of their distinct cut, style, drape or weave. The Museum of Natural History will serve as home for this exhibition from December 15 through March 1978.

Atom Smashers: Fifty Years
The Museum of History and Technology presents an exhibition which traces the history of high energy particle accelerators, beginning December 1. Several historic accelerators and entire bubble chambers will be displayed. The first major exhibit of its kind, it will remain on the museum's first floor for several years.

Gregory Gillespie
The Hirshhorn Museum presents the first comprehensive Gillespie exhibition, including 75 paintings, from December 22 through February 12, 1978. Landscapes, interiors, city scenes and full-sized wall studies will be included (see below).

Continuing events

U.S. Navy Commodores
This jazz band continues its noon concerts on Mondays and Fridays through December 16 in the Museum of History and Technology.

Division of Performing Arts and Musical Instruments
- "Big Chief" Wilbert Ellis, supported by the Barrelhouse Rockers, offers an evening of Alabama piano blues at 8 P.M. on December 4 in Baird Auditorium, Museum of Natural History.
- Jazz trumpeter Art Farmer performs at 6 P.M. December 11 in the Hirshhorn Museum auditorium.
- The Bach Gamba Sonatas will be performed on 18th-century instruments from the Smithsonian collection at 8:30 P.M. on December 12 in the Hall of Musical Instruments, Museum of History and Technology. For information, call (202) 381-5395.

Hirshhorn Museum films
- Films about artists will be shown on December 1, 2, 5 and 7.
- Films by artist-filmmakers are shown on Thursdays and Fridays at 8 P.M.
- Children's films are shown on Saturdays at 11 A.M., in the auditorium.

National Air and Space Museum
- "Star Birth in the Milky Way" will be

Self Portrait (On Bed), 1974 can be seen in Hirshhorn's Gillespie show.

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(signed) Joseph J. Bonsignore
Associate Publisher

discussed by Bart J. Bok in the Spacearium at 8 P.M. December 14.

• "Today We Live," a World War I aviation film, will be shown at 7:30 P.M. December 1 in the Museum's auditorium.

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• Colorado Springs, Colorado—"Contemporary Stage Design—U.S.A.," Colorado Springs Fine Arts Center, December 10—January 8, 1978.

• Storrs, Connecticut—"22 Polish Textile Artists," Benton Museum, December 3—January 1, 1978.

• St. Joseph, Missouri—"American Drawings 1976," Albrecht Art Museum, December 10—January 8, 1978.

• Columbus, Ohio—"New Glory Part II," Columbus Gallery of Fine Arts, December 10—January 8, 1978.

• Bethlehem, Pennsylvania—"American Coverlets," Historic Bethlehem, Inc., December 3—January 1, 1978.

• West Liberty, West Virginia—"20 Bicentennial Banners," West Liberty State College Art Department, December 3—January 1, 1978.

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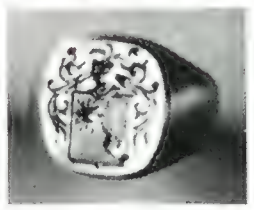

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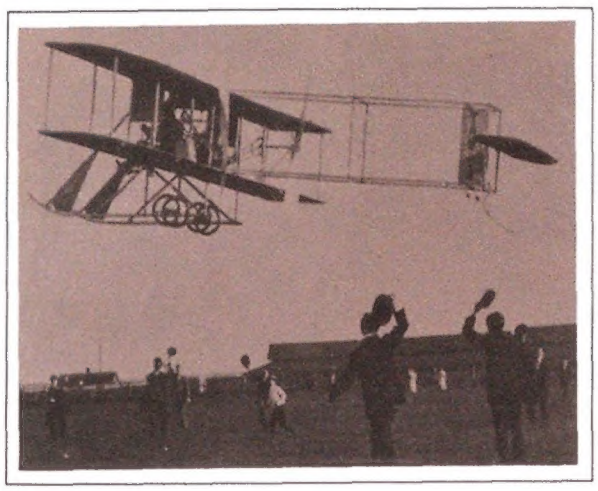

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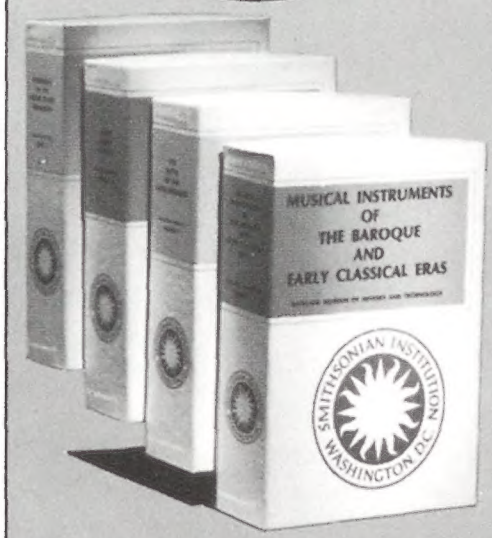

Portraits of US Presidents

From the National Portrait Gallery and White House collections, this set of 37 slides depicts Presidents from Washington to Ford. A short biography of each President included. Sets are $25.

First Ladies' Gowns

The unique gowns of the First Ladies of the White House are presented in this set of 42 slides. Literature identifies each gown, its fabric and style. Sets are $20.

Suiting Everyone

Based on the exhibit "Suiting Everyone" in the Museum of History and Technology. This set of 80 slides presents a broad cross-section of clothing in America, from the 18th c. to the present, ranging from ordinary work clothes to exquisite formal wear. Sets are $20.

Musical Instruments of the Baroque and Early Classical Eras

This set of 57 slides illustrates fine examples of instruments from the Smithsonian collection. Two audio cassettes are included: an accompanying narrative and Baroque works performed on instruments of the period. Sets are $25.

The Battle of the Little Bighorn

The story of this controversial battle is presented in this set of 80 slides. Includes life portraits of participants, a series of drawings by Red Horse and artifacts from the time. Background account, captions and map included. Sets are $25.

Ghost Dance Tragedy at Wounded Knee

The story of the Wounded Knee tragedy is told thru 19th c. photographs of Indian and Army participants, Sioux Reservations and Ghost Dances, as well as artifacts from the scene. Booklet gives background account, captions and maps. Sets are $25.

Postal Rarities

From the Smithsonian's National Postage Stamp collection, this unique set depicts 50 US and Foreign rarities. Guide provides informative descriptions of each slide. Sets are $20.

Buffalos, Eagles and Elephants

Especially for elementary schools, this set of 65 slides introduces the role these three animals or their ancestors have played in the history of North America. Cassette tape, script and captions included. Sets are $20.

Please send the following sets _____

Total enclosed _____ Name _____

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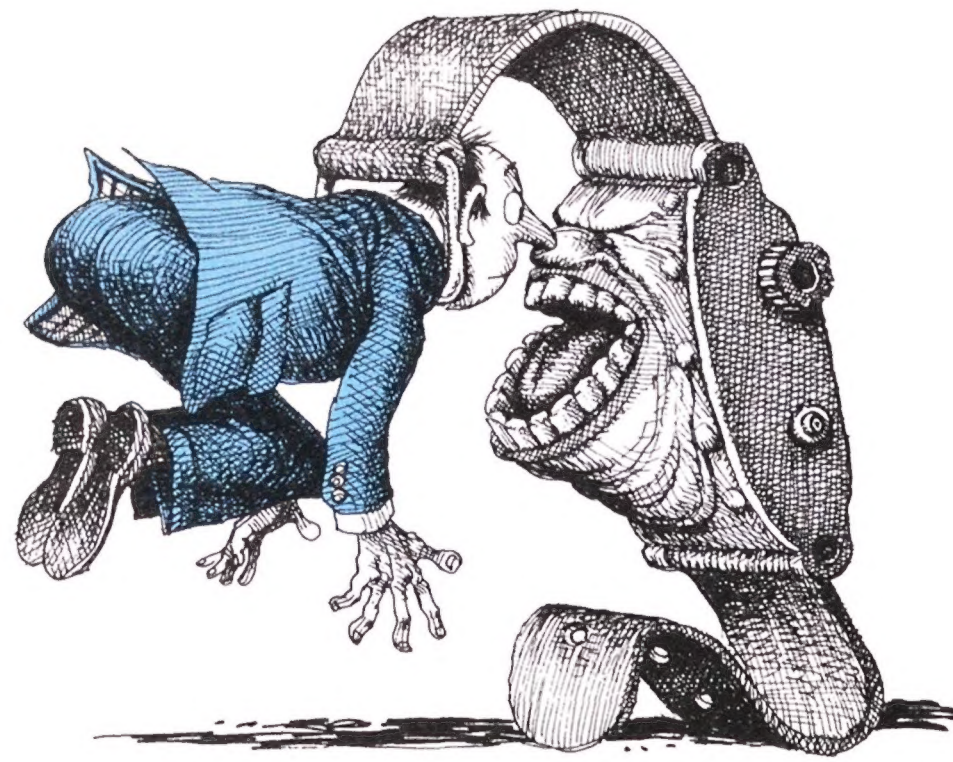
Mail orders to: Photographic Services, Smithsonian Institution, Washington, D.C. 20560

By Patrick Ryan

It ticks and it talks —it may be too much



Regarded from the receiving end, it seems that the principal failing of latter-day scientists is inaccuracy of aim rather than insufficiency of endeavor. Researchers still insist on applying all their best efforts—and most of our money—to providing us with new things that we don't want. They give us the Concorde when we'd much prefer a cure for the common cold. They provide us with intimate pictures of Mars, although we'd sooner have an everlasting shoelace. They present us with transistor radios when all we really want is a little public peace and quiet.

Current maintenance of this technological perversity may be detected in a newspaper report that "the head of a New York research and development company has been granted a patent for a talking wristwatch, the commercial production of which is set for next year. It . . . functions by means of coupling a miniature speaker to a solid-state memory" which changes the data bits to analogue signals that are amplified and correspond to the time. Besides showing the figures 10:24, for example, it will pronounce "ten twenty-four."

Although I cannot remember anyone within my ken actually clamoring for a talking watch (though Dick Tracy would have been lost at times without his two-way wrist radio), it is likely that a portable instrument which articulates the time would be of benefit to the blind. And its further ability, according to the patent, to compose "a reasonably faithful reproduction of any selected person's voice" may well make its development of profitable interest to some other people.

The day-long presence of loudspeakers on the wrists of hordes of potential customers could well provide advertising agents with a new mass-media outlet. With the addition to the chronometric solid-state memory of a few more solid-state components, sonic watches might be marketed to give out, every quarter hour, spot commercials advising the wearer and all within earshot how to spend their money to obtain whiter-than-white teeth, achieve complexions like Cleopatra or grow hair on billiard balls.

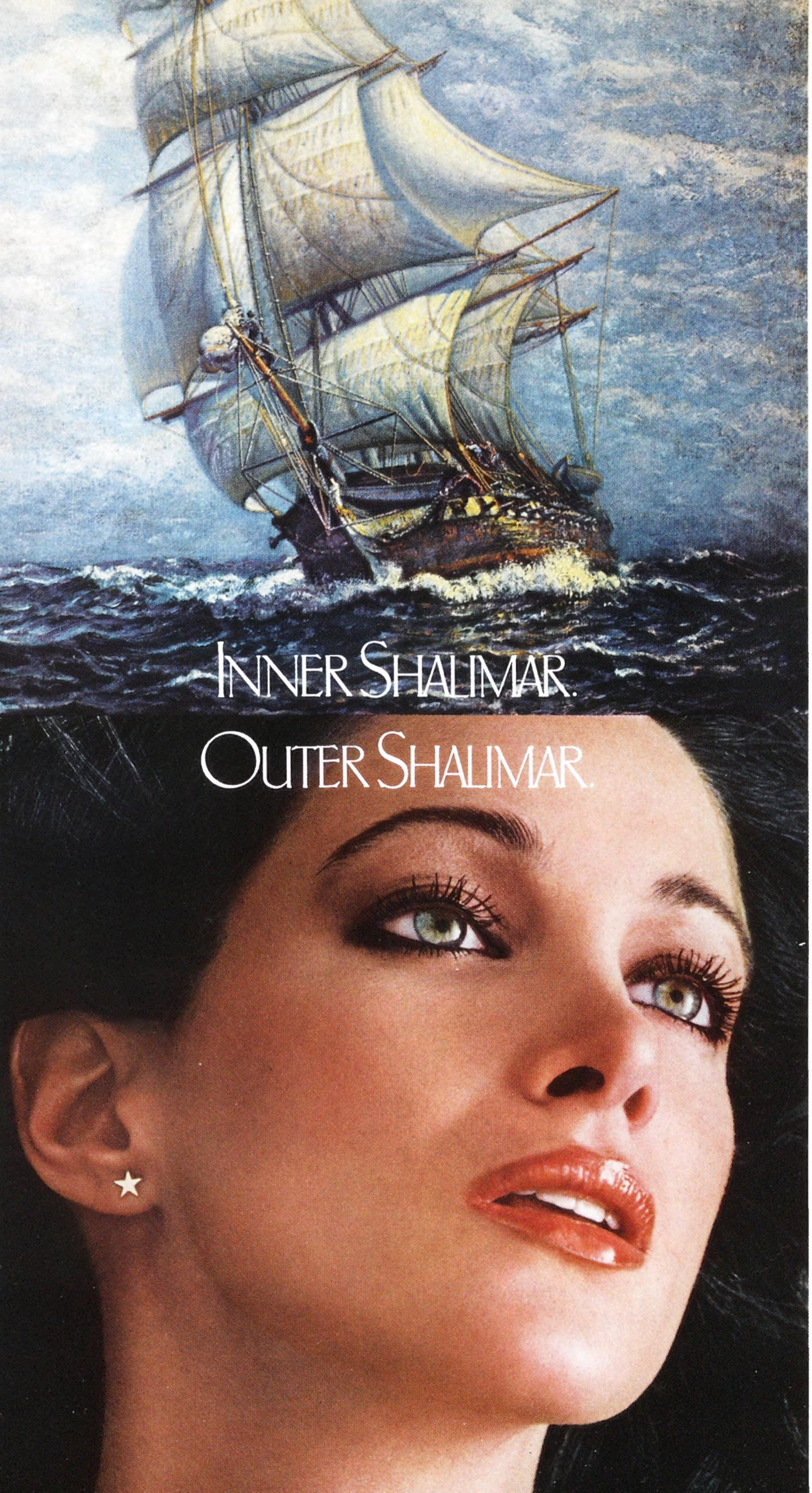
Business secretaries with amnesiac bosses would welcome the facility to record the master's appointments for the day into his voluble timepiece. No matter where he might hide away from his ordained treadmill, her reminding voice would pipe up from his wrist with ten minutes' warning of each coming commitment. And while the same boss was busy each morning shaving his important jowls, his wife could make use of the same contrivance to insert, at strategic points in her husband's coming day, her loving admonitions to him to go easy on the lunchtime cholesterol, take his lecherous hands off the above-mentioned secretary, and get the hell out of that bar and hightail it home.

Evangelists competing for available lost souls might gainfully offer preaching watches to declaim, at half past every hour, uplifting minisermons, promises of paradise for conformers, premonitions of hellfire for the rest, and *memento mori* quotations from Ecclesiastes emphasizing that no matter what time your oratorical watch declares it to be, it's always later than you think.

There might also be a demand from business-school graduates on the opening laps of the rat race for a watch that would accompany each time signal with get-up-and-go dictums from Henry Ford, Andrew Carnegie and Frank Gilbreth, each exhortation calculated to inspire in the breast of the true organization man a renewed dedication to positive decision making, dynamic action, meaningful communication, and rapid multiplication of stomach ulcers.

For older and despairing rat racers who have already been lapped by half the field, a philosophical watch might be more suitable. The comforting aphorisms recorded therein—perhaps spoken by Dean Martin—would be drawn from the hedonist or what-the-hell-anyway school of philosophers. These would generally emphasize the final vanity of earthly endeavor, support Omar Khayyám's recipe that paradise here below can be achieved on a modicum of booze, bread and affectionate damsels, and second Emerson's contention that it'll all be the same a hundred years from now.

One wonders, though, if it may not be more to the benefit of our future tranquillity if the inventors of the loquacious watch stifle any urge to develop it further. In their discouragement, perhaps we should all ponder the economy and serenity to be found in the temporal approach of William Hazlitt, who recorded that "I never had a watch nor any other mode of keeping time in my possession. . . . When I am in a town, I can hear the clock; and when I am in the country, I can listen to the silence."



Like every woman, every great perfume has both an outer expression and a deeper, inner mood.

How many bold smiles reveal an inner shyness? How many accidental touches are meant as an inner embrace, warm and loving?

Outwardly, Shalimar expresses elegance, calm... a serene femininity.

But stay with the magnificent scent long enough and you will discover its inner mood...a clipper ship slicing through the seas, the power of a storm about to break, a deep sensuality waiting to be released.

You don't just dab on a perfume like Shalimar. You wear it body and soul.

SHALIMAR
BY GUERLAIN.

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